

Business Briefing: Telecommunication Systems

-Overview of Telecommunication Systems-

Fujikura Ltd.

Noriyuki Kawanishi,

Corporate Officer and Head of Telecommunication Systems Business Unit

March 22, 2024

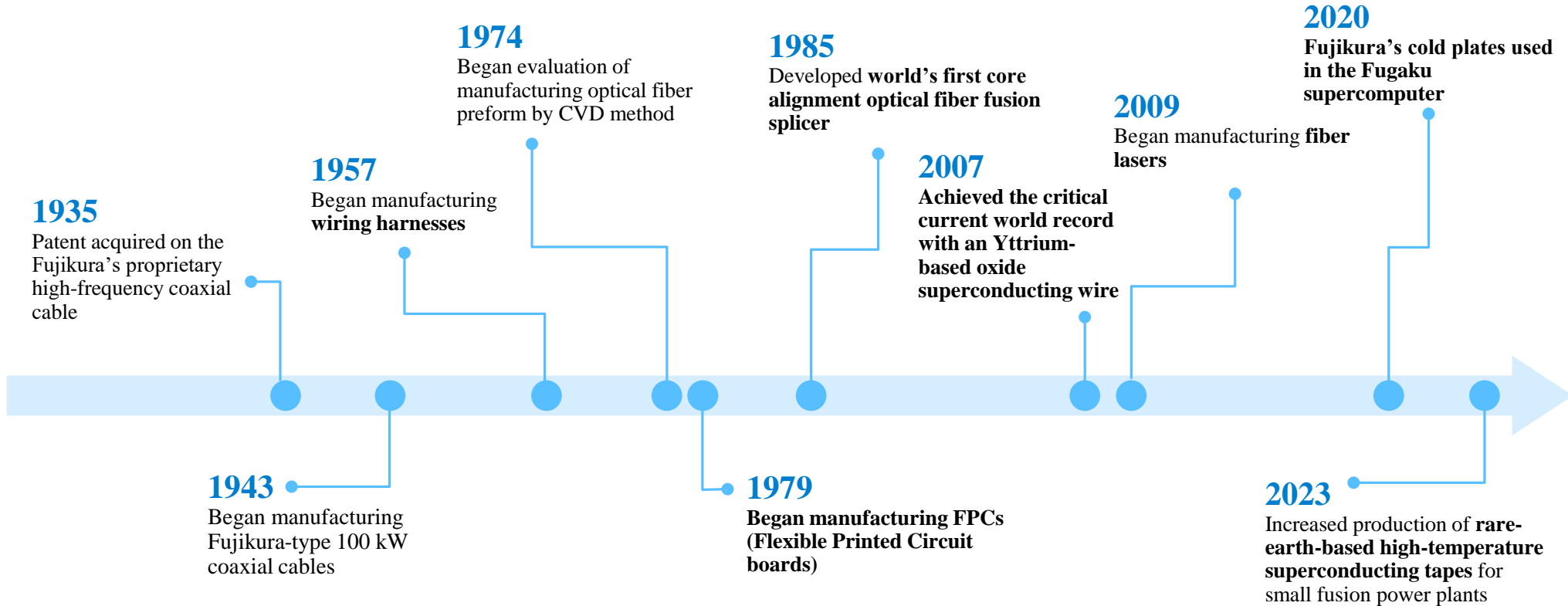
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| 2. Achieving 2025 Mid-term Management Plan | | 10 |

1. Business Overview

History of the Fujikura Group

- In our nearly 140-year history, since our founding in 1885, we have innovated and applied our proprietary technologies to create new products based on changes in society.



The Beginning (1885-)

Known for its technology, Fujikura has contributed to the creation of an abundant society by establishing electric power and communications infrastructure

2nd Phase of Reinvention (1945-)

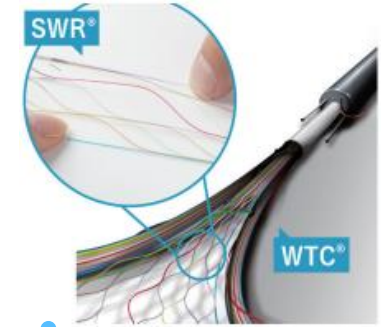
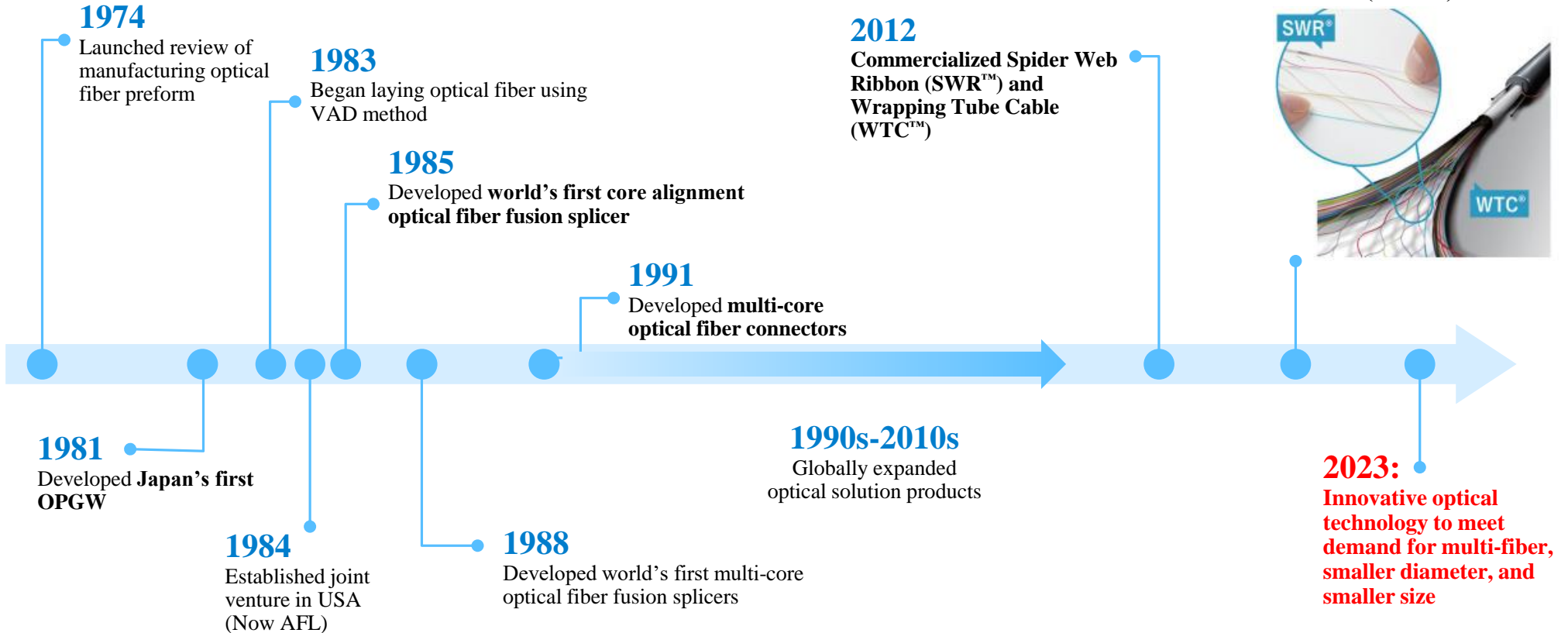
Expansion into the power and telecommunication systems, promoting diversification, globalization, and new businesses

3rd Phase of Reinvention (2005-)

Set forth a long-term vision and pursued further technological development and market access

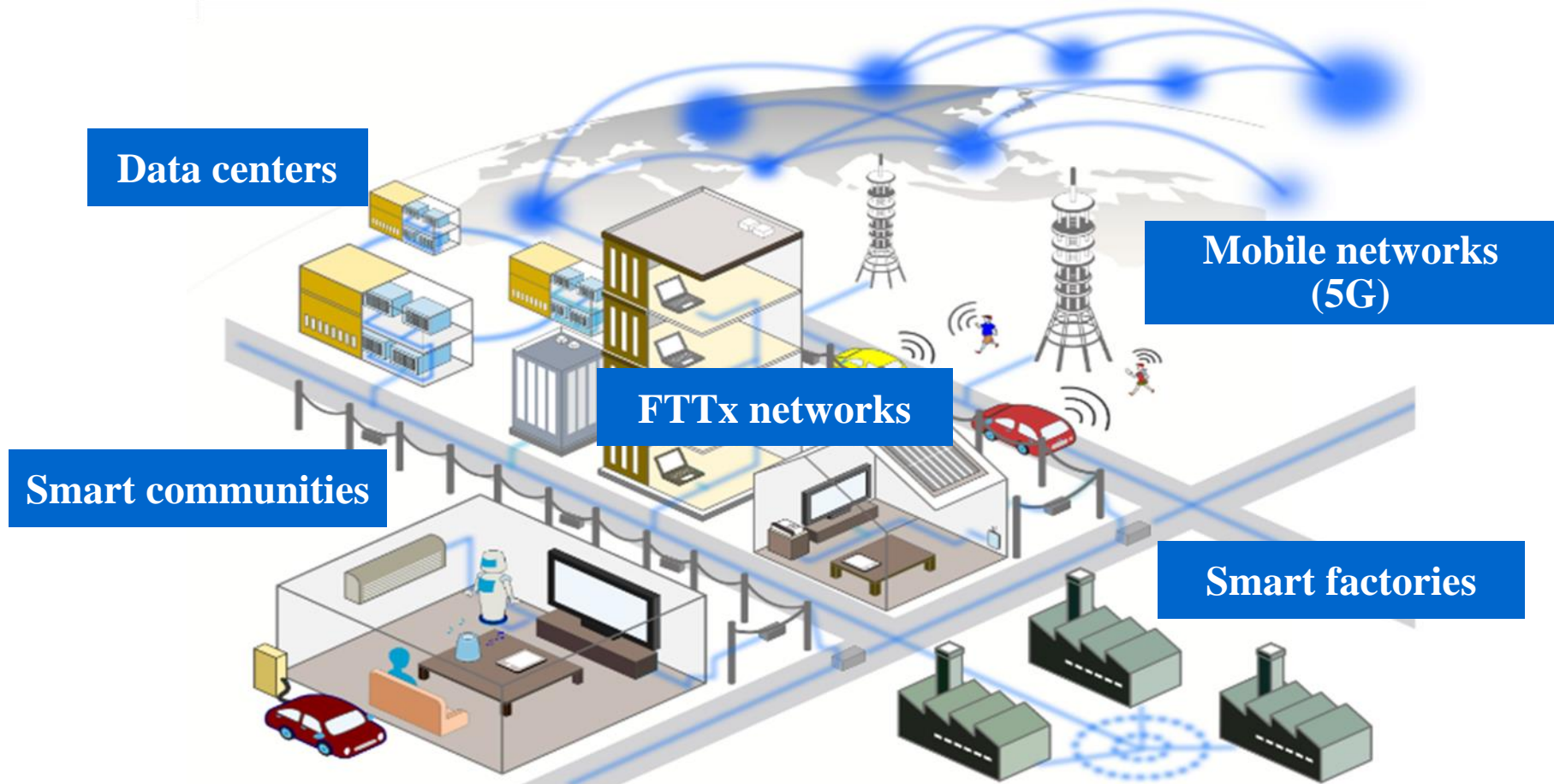
History of Telecommunication Systems

- Fujikura began developing optical-related technology in the 1970s in anticipation of the growing use of the Internet



Business Fields

- Contributing to the society by delivering innovative optical wiring solutions for development of telecommunications and data center infrastructure



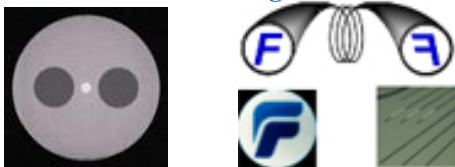
Main Products and services

Optical fiber

Optical fiber and optical fiber preform for communications



PANDA / Image fiber



Optical connection equipment and components

Optical connectors / Wiring components / Optical devices

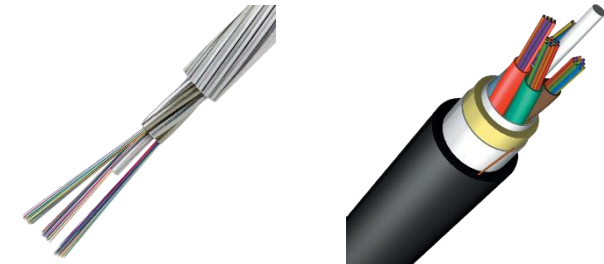


Optical cables

SWR™ & WTC™ / Optical cables



OPGW / ADSS



Fusion splicers

Fusion splicers for telecommunications and plants



Engineering

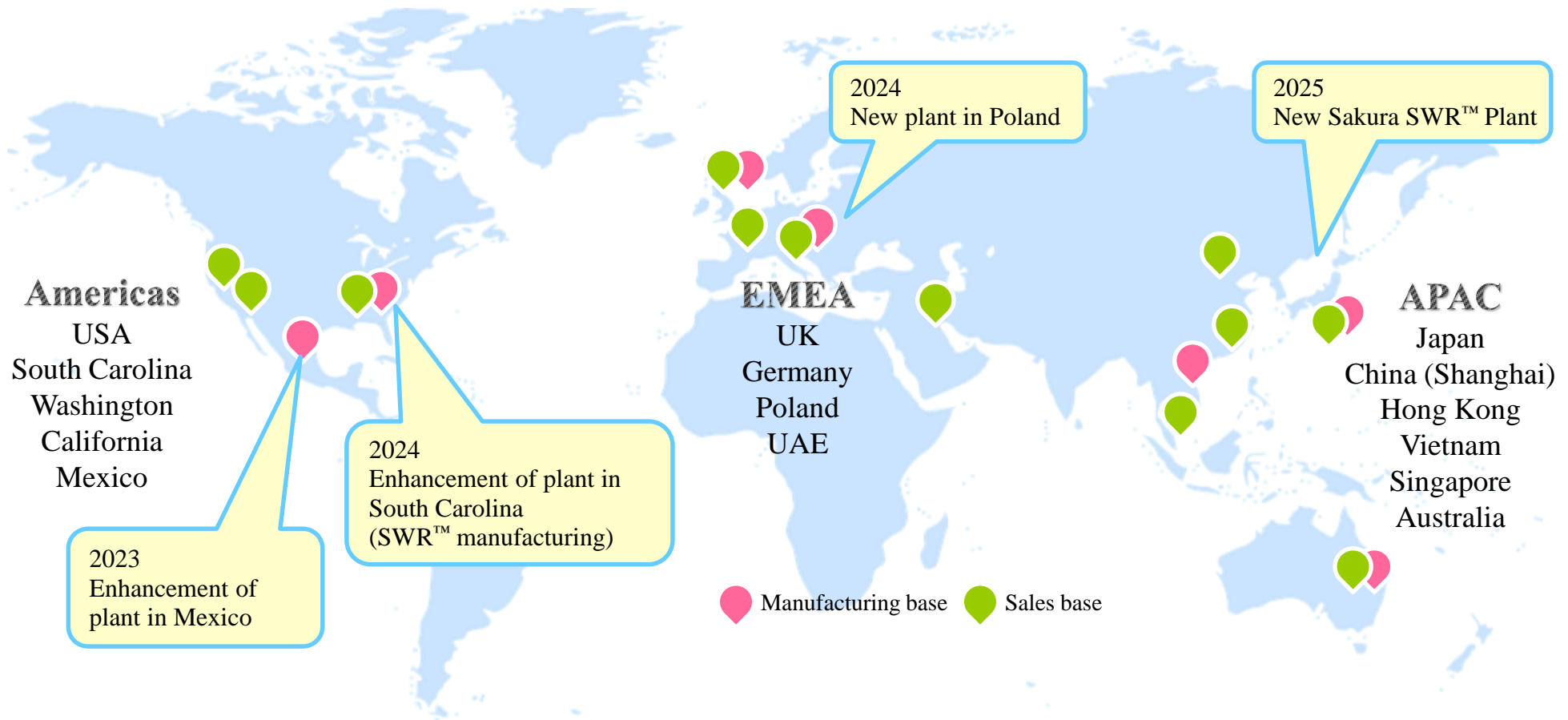
FTTx, 5G, and DAS design and construction





Global Business Structure

- Our global manufacturing and sales bases allow us to swiftly and flexibly address customer needs in Americas, EMEA and APAC





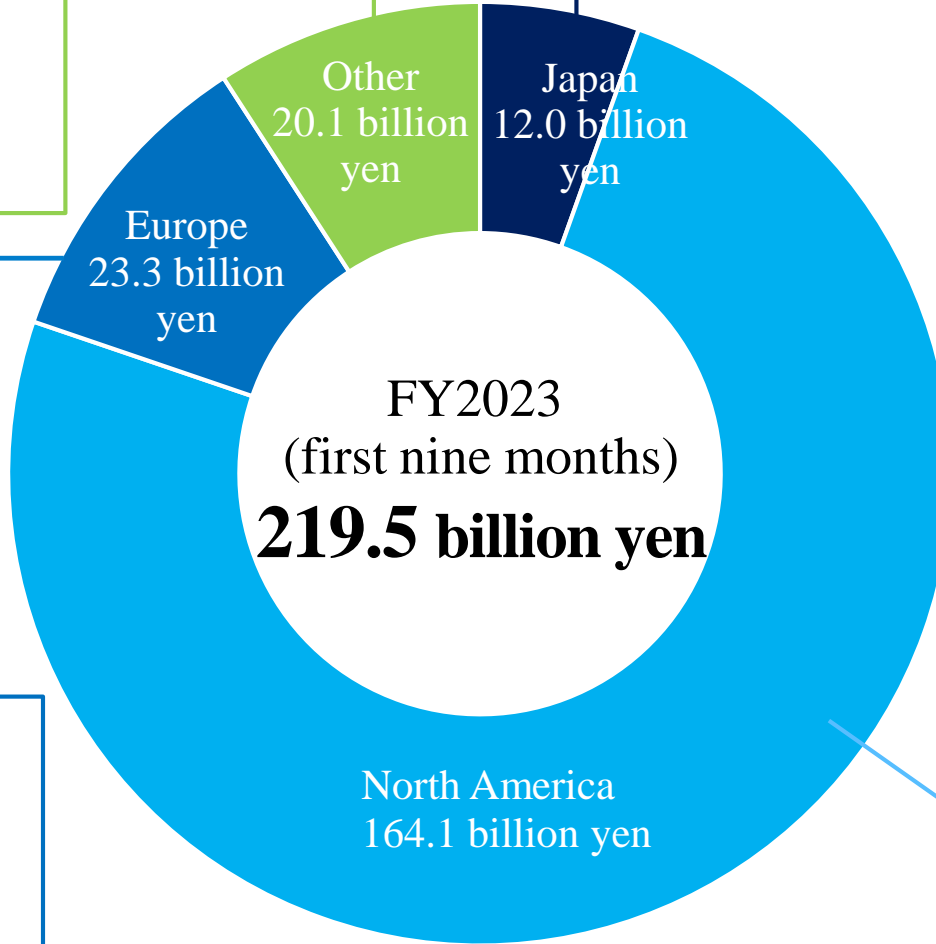
Net Sales by Region

Main customers: Telecom companies

Main products: Optical fiber
Optical cable
Optical connection equipment and components
Fusion splicers

Main customers: Telecom companies, HSDC

Main products: Optical cable
Optical connection equipment and components
Fusion splicers



FY2023
(first nine months)
219.5 billion yen

Main customers: Telecom companies, Railways, CATV, HSDC

Main products: Optical fiber
Optical cable
Optical connection equipment and components
Fusion splicers

Main customers: Telecom companies, CATV, HSDC, Power companies

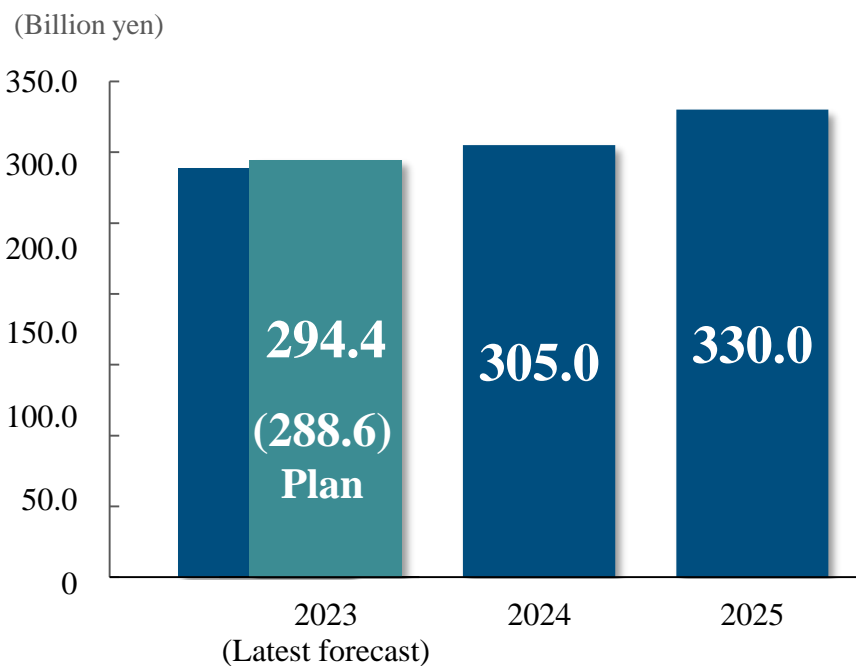
Main products: Optical cable
Optical connection equipment and components
OPGW
Fusion splicers
Engineering



2025 Mid-term Management Plan Targets

- We aim to improve profitability to surpass 50.0 billion yen in operating income and a 15% operating margin

Net Sales Over Time

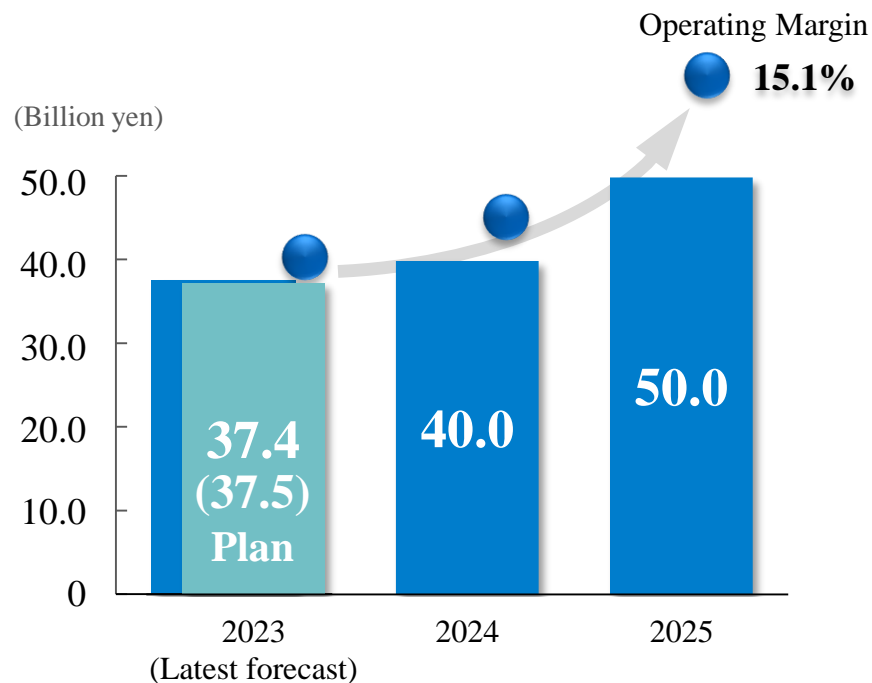


<Exchange rate> USD= USD= USD=

 143.75 120.00 120.00

 (Plan: 130.0)

Operating Income Over Time



<Exchange rate> USD= USD= USD=

 143.75 120.00 120.00

 (Plan: 130.0)

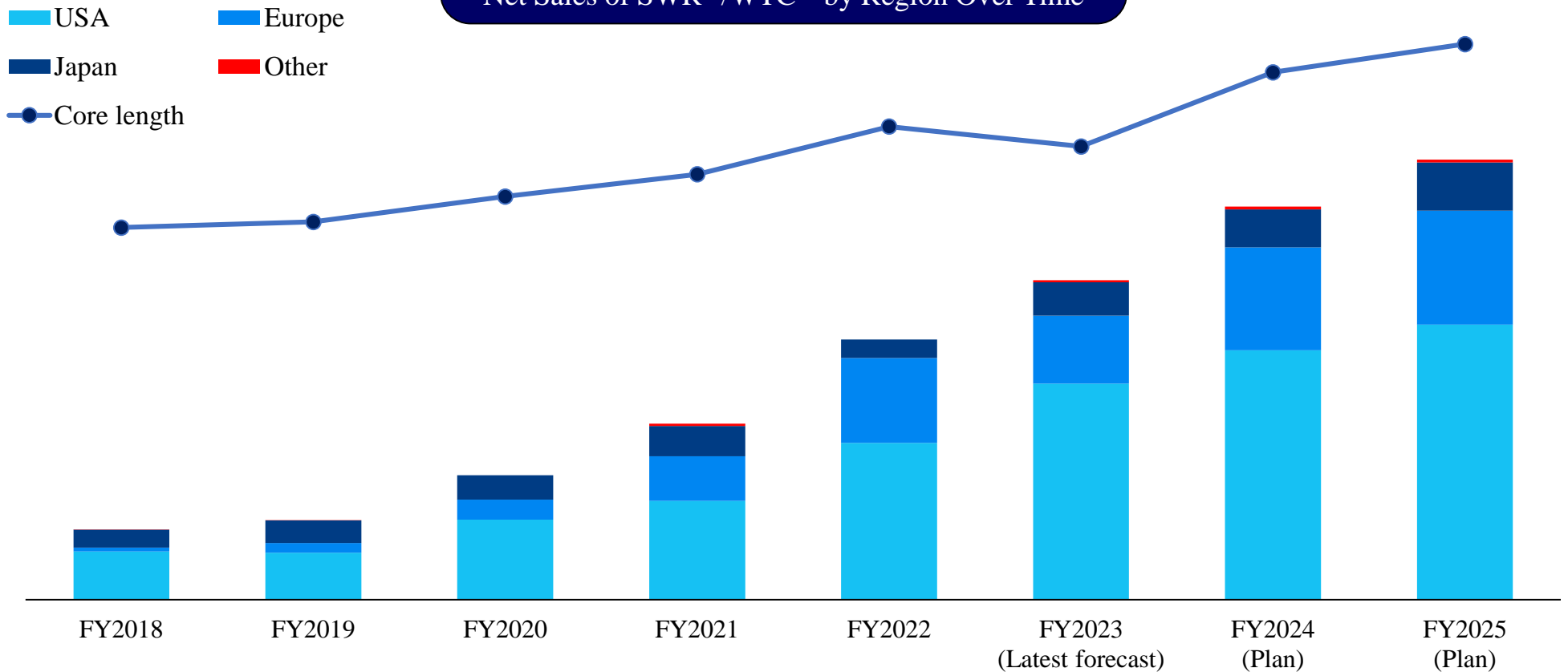
2. Achieving 2025 Mid-term Management Plan



SWR™/WTC™ -Focus Areas and Targets-

- Focus on further increase market penetration in North America and the UK, and further expand sales in the Middle East, Europe, and Australia
- Promote product development to address diverse customer needs, including telecommunications companies and HSDCs

Net Sales of SWR™/WTC™ by Region Over Time



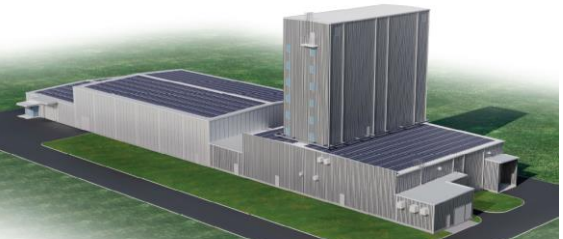


SWR™/WTC™ - New Factory of SWR™ and Strengthen competitiveness-

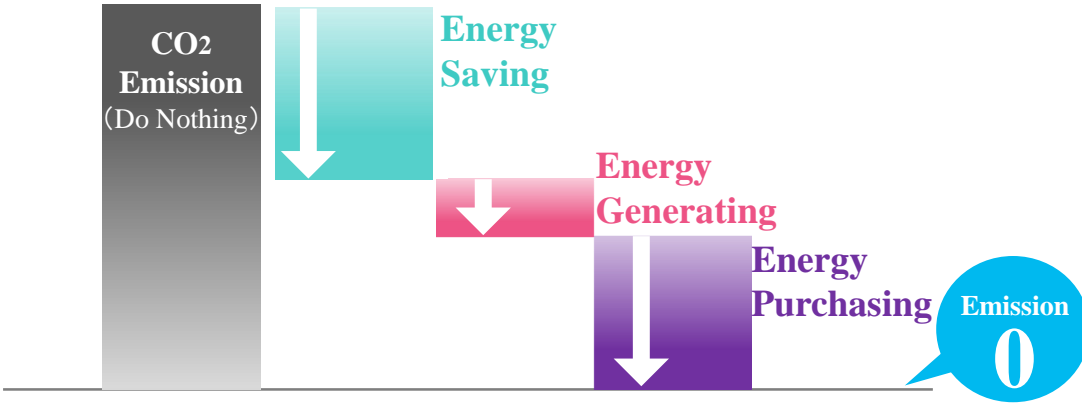
- Increase capacity to meet growing demand and strengthen cost competitiveness for the future

- New Factory Carbon Neutral Plan
Carbon neutrality is also a source of competitiveness.

▼ Rendering of the factory

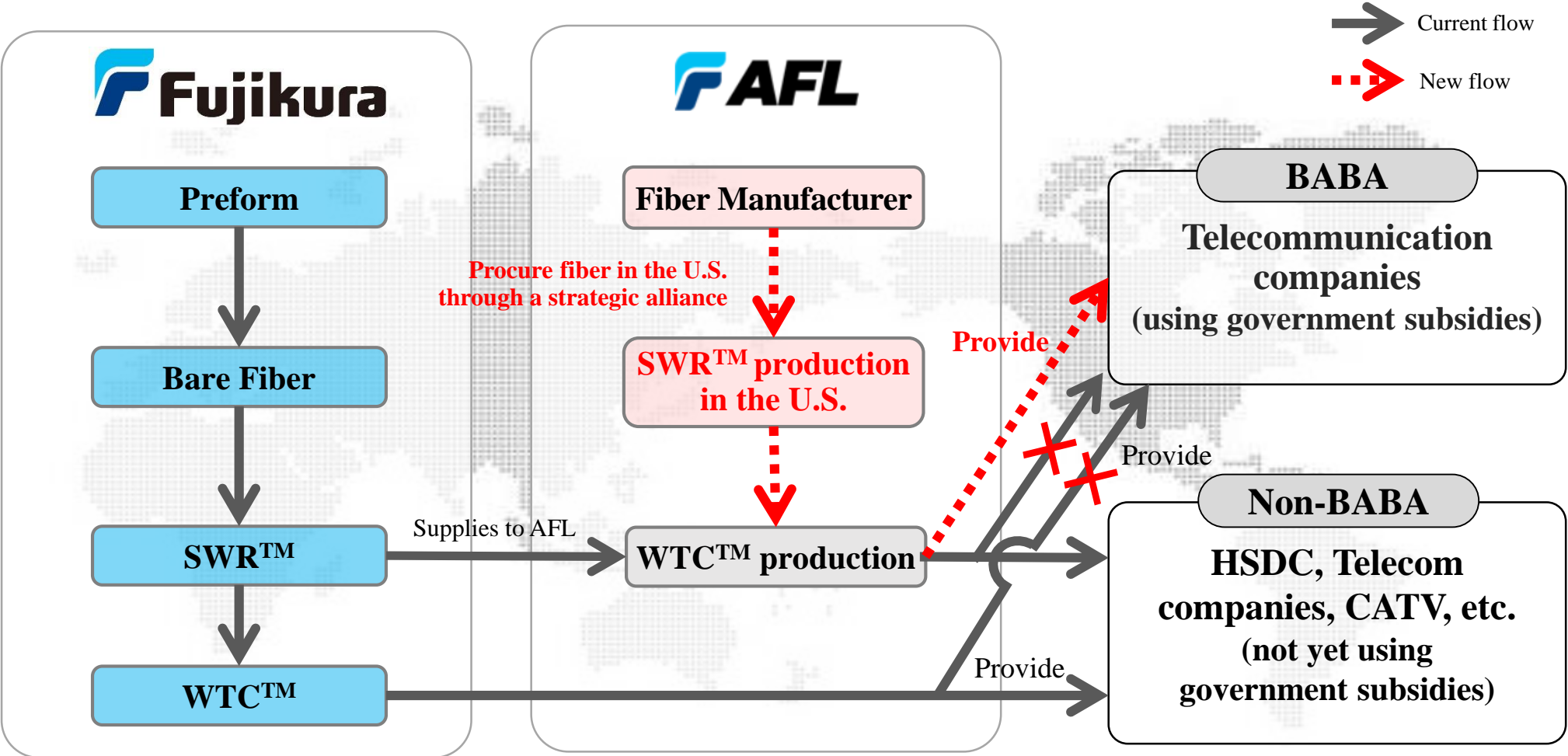


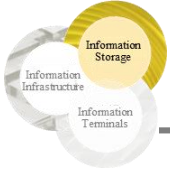
▼ New factory under construction



SWR™/WTC™ - Response to BABA-

- Set up SWR™/WTC™ manufacturing in the U.S. in response to BABA* and capture demand for ultra-high-density high-fiber-count optical cable (WTC™), even after operation of BABA commences in 2024.





Strengthen the optical connection equipment and components production structure

- Strengthen global structure with an eye toward the expanding demand for hyperscale data center (HSDC) investment in the U.S. and Europe.



AFL Telecommunications Poland

Established: 2023
Location: Katowice, Poland
Business description: Manufacture and sale of optical components, etc.
Production capacity: Plans to secure eight lines in the next two years
Employees: Around 300 (plan after plant operation commences)



AFL Telecommunications (Monterrey)

Established: 1999
Location: Monterrey, Mexico (two hours from the Texas, U.S. border)
Business description: Manufacture of optical components, etc.
Employees: Over 5,000 (plan after new plant operation commences)

As of 2023, currently building a new plant to further boost production capacity. Plans to double plant site area after operation commences.



Disclaimer:

Statements about financial forecasts and other forward looking statements in this document are based on the latest information available to the Company and certain assumptions deemed reasonable at the time. Fujikura does not guarantee the achievement of these forecasts. Actual results may differ due to various factors.

Business Briefing: Telecommunication Systems

-Data Center Market Outlook and Our Strengths-

Fujikura Ltd.

Kansei Shindo,
General Manager, Optical Component Division,
Telecommunication Systems Business Unit

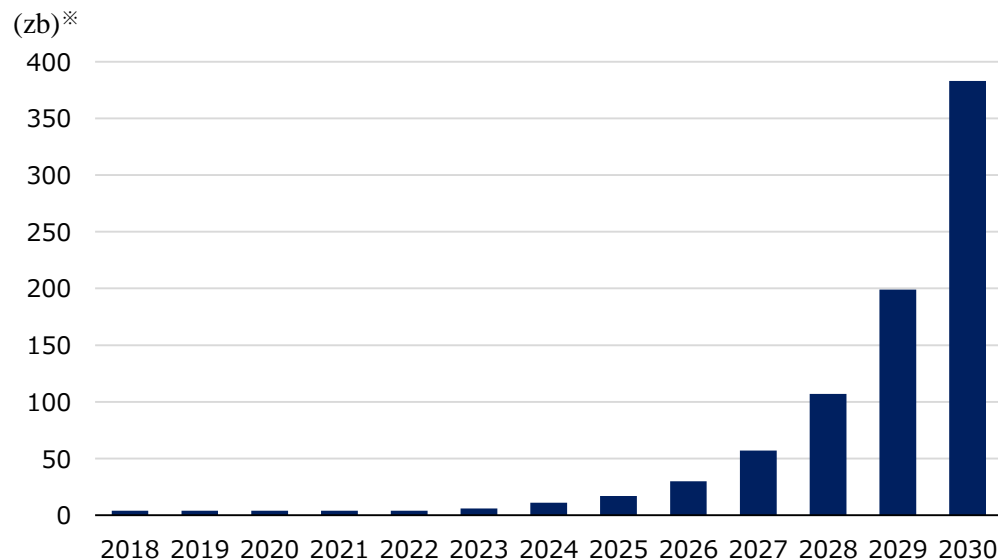
March 22, 2024

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1. Market Environment (Global Trends in Data Traffic)

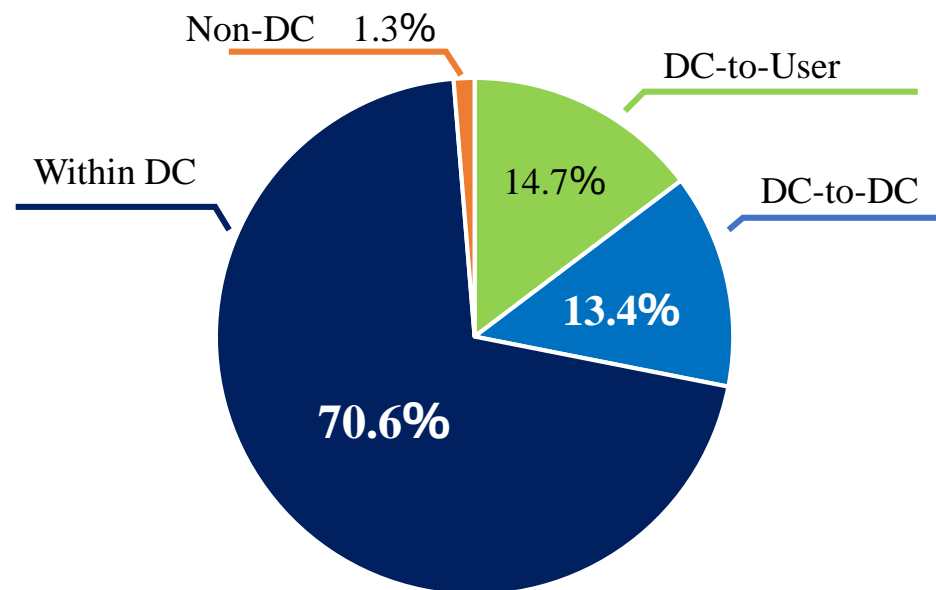
- Data traffic is expected to increase by 400 times over the 10 years since 2020 (Streaming media, data monitoring, sensors, social media, remote learning, AR, VR, online games, and online applications are the major drivers of the growth.)
- About 80% of data traffic is within/between cloud data centers (DCs)
 - Increasing demand for high-capacity, high-speed, low-latency communications
 - Increasing demand for multi-fiber and higher density optical cables/connectivity in addition to higher speed optical transceivers

Data Traffic Prediction



*zb (zettabyte) is 10 to the 21st power

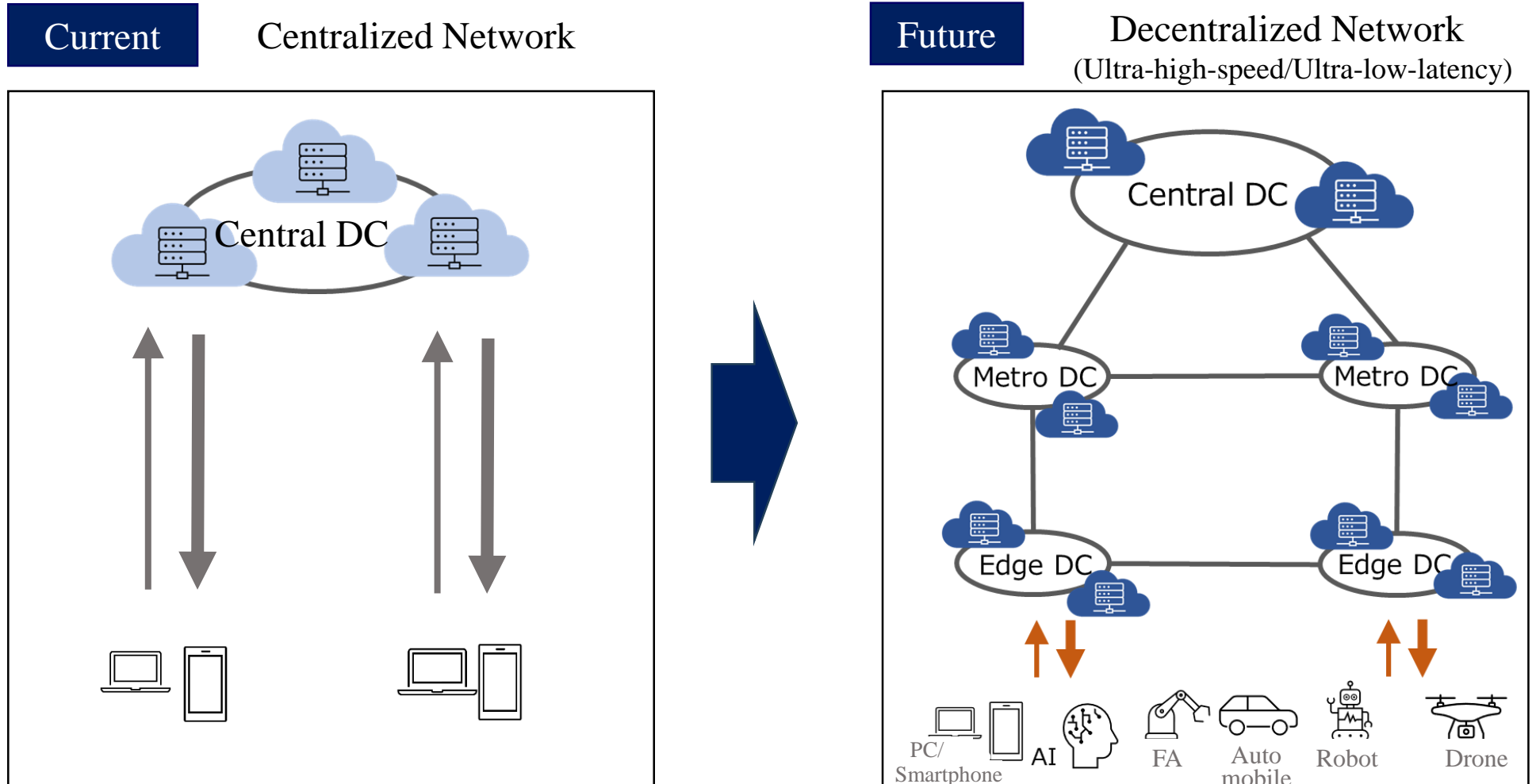
Global IP Traffic (2021)



Source : IoT Times, How to Avoid HPC Data Traffic Jams with High-Speed Interface IP (2020/12); IBS, Impact of AI on Electronics and Semiconductor Industries (2020/04)
Cisco Systems, Cisco Global Cloud Index: Forecast and Methodology, 2016-2021 (2018/02); Cisco Systems, The Zettabyte Era: Trends and Analysis (2017/06)
Pie chart produced in-house based on Cisco data

1. Market Environment (DC Decentralization)

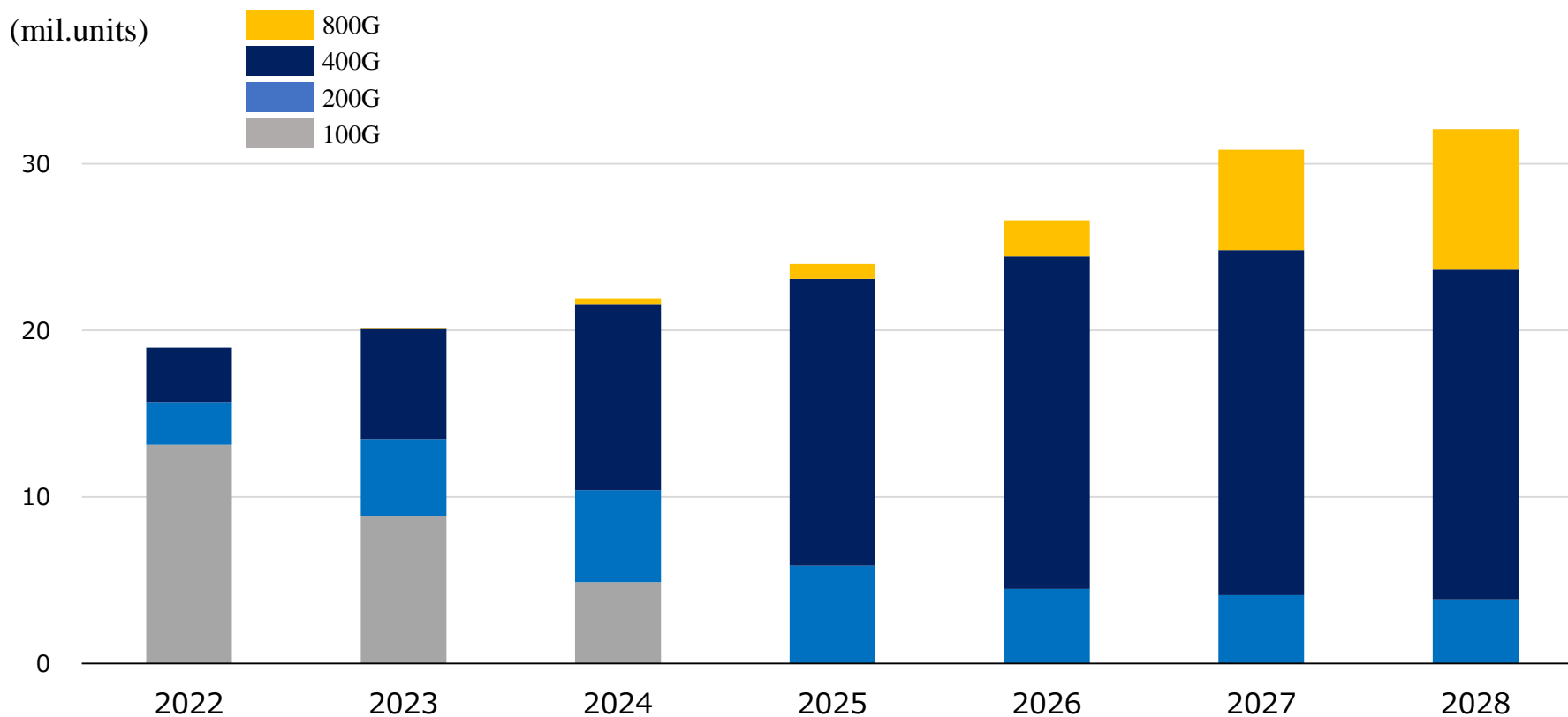
- Decentralized data processing and power consumption for diverse services
 - Communication networks between DCs also need to support low latency, etc.
 - Increased demand for data center to data center and edge DC optical cable/optical connectivity



1. Market Environment (High-speed Optical Transceivers)

- Increasing need for high-capacity, high-speed and parallel transmission optical transceivers
- Large-scale DCs drive demand for single-mode fiber (SM)-type optical transceivers for medium-haul transmission applications

Optical Modules by Data Rate

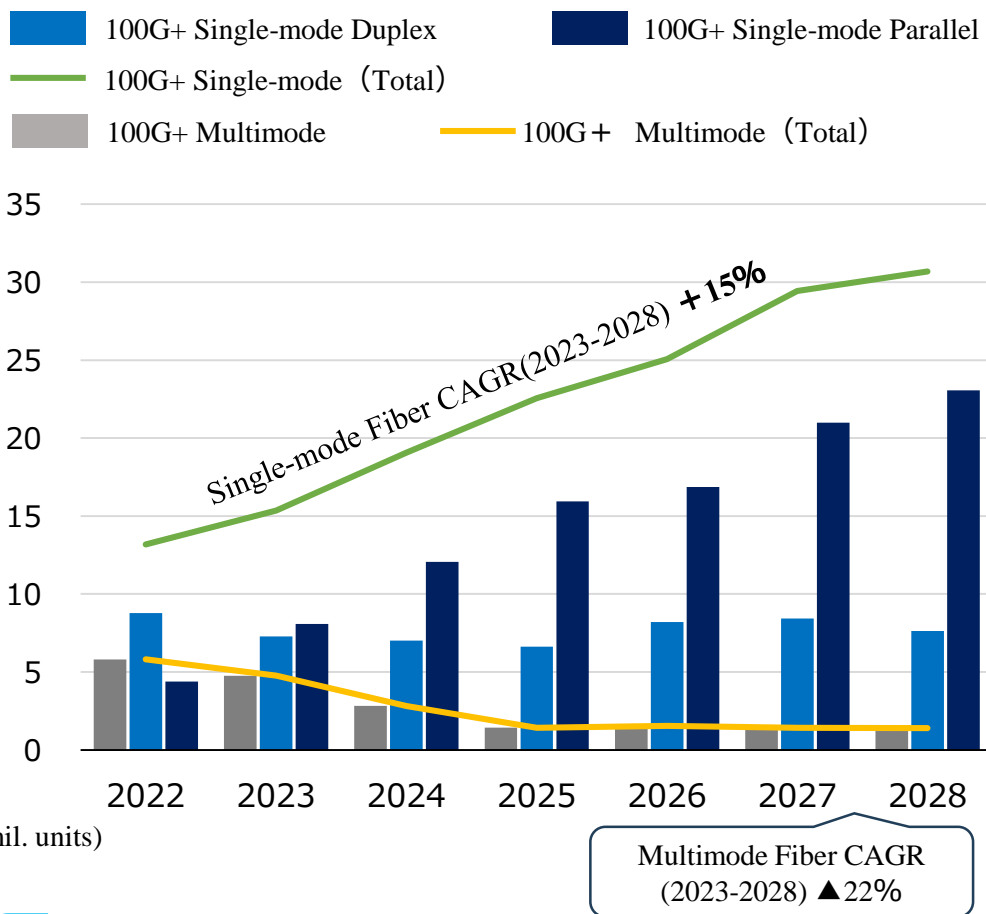


Source : OMDIA, ICP Data Center Network Optical Components Forecast, 2022–28 (2023/06)
Chart produced in-house based on the data above

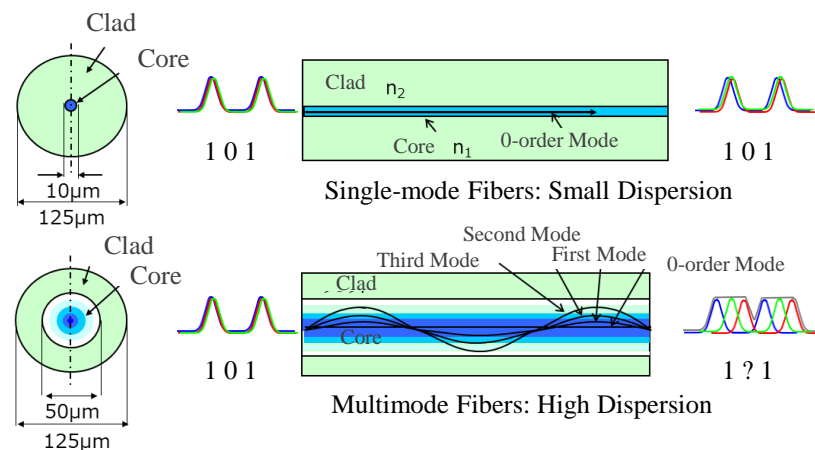
1. Market Environment (Increasing Demand on Single-mode Fiber)

- Increase in transmission methods using single-mode fibers capable of high-speed transmission
 ⇒ Demand on single-mode fiber wiring increasing year after year

ICP Data Center Modules



Difference between Single-mode and Multimode Fibers



Multimode fiber has higher dispersion than single-mode fiber; this characteristic limits transmission speed.

- There is growing demand for single-mode fibers, where Fujikura has competitive edge.

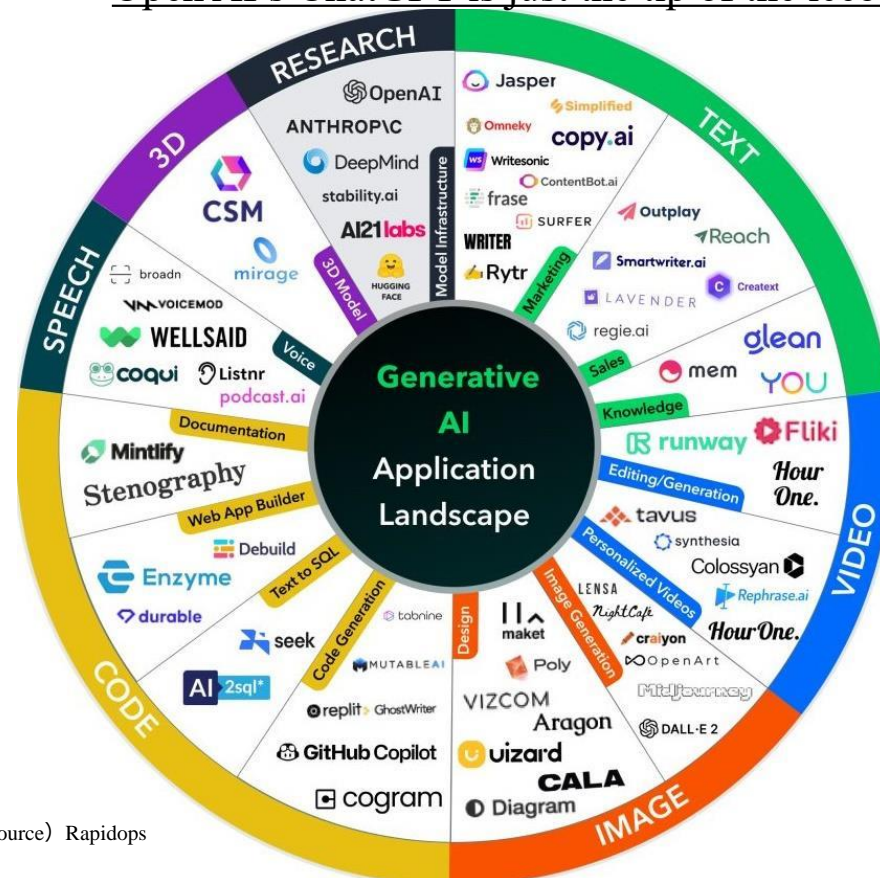
Source : OMDIA, ICP Data Center Network Optical Components Forecast, 2022-28 (2023/06)
 Chart produced in-house based on the data above

2. Further Expansion of Data Center Market arising from AI Demand (1/3)

- The prediction for generative AI through the 2030s is that it will be utilized in text, coding, images, videos, 3D, and gaming, in that order
- Global generative AI market size is expected to grow to about 14 trillion yen by 2030, at a CAGR of 35.6% during the period from 2022 to 2030

Generative AI Applications:

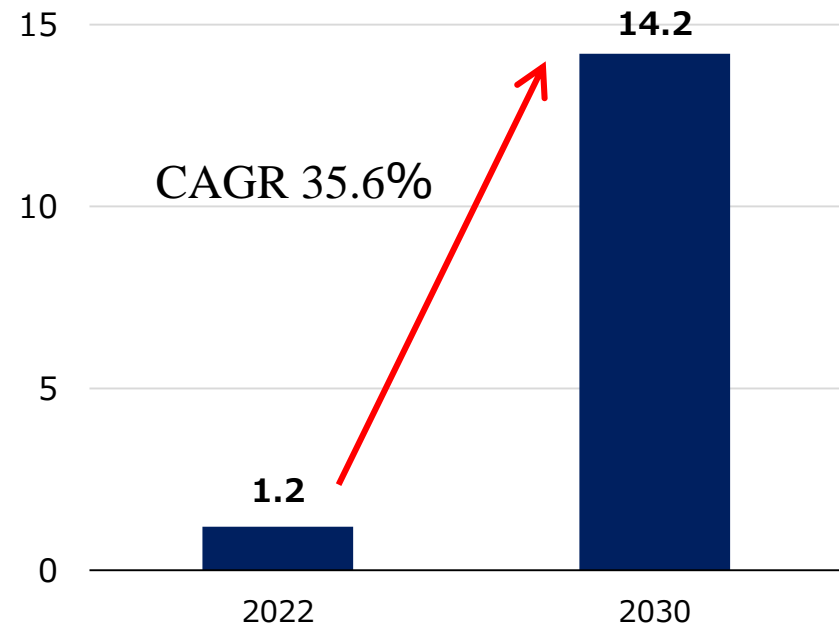
Open AI's ChatGPT is just the tip of the iceberg



(Source) Rapidops

Global Generative AI Market Size:

2030 : 14 trillion yen



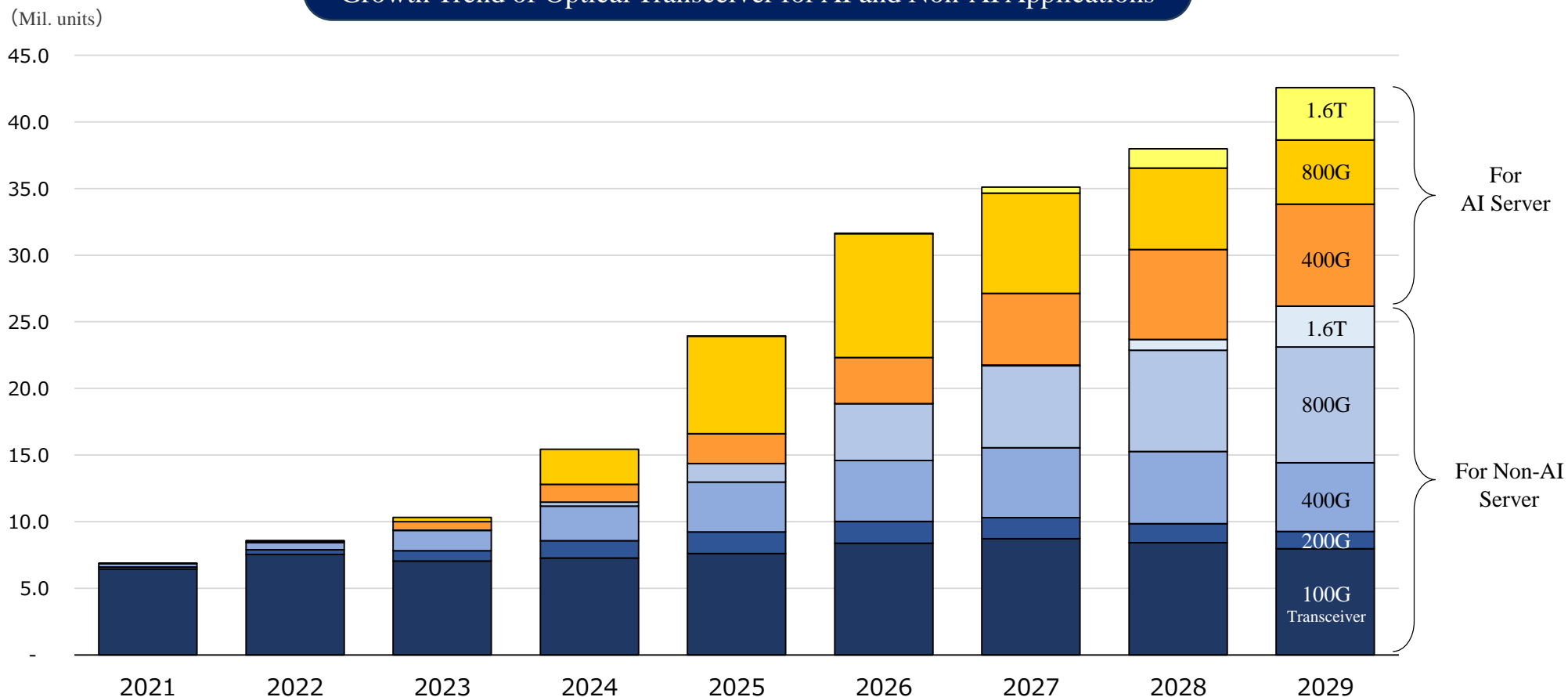
(Source) investigation by Grand View Research Inc.

Source : Rapidops, Generative AI Application Landscape (2023/03)
MIC, WHITE PAPER Information and Communications in Japan (2023/07)
Chart produced in-house based on MIC/Grand View Research data

2. Further Expansion of Data Center Market arising from AI Demand (2/3)

- Expansion of cloud DC demand arising from expansion of AI demand
- High-speed, large-capacity transmission processing within AI-related facilities

Growth Trend of Optical Transceiver for AI and Non-AI Applications

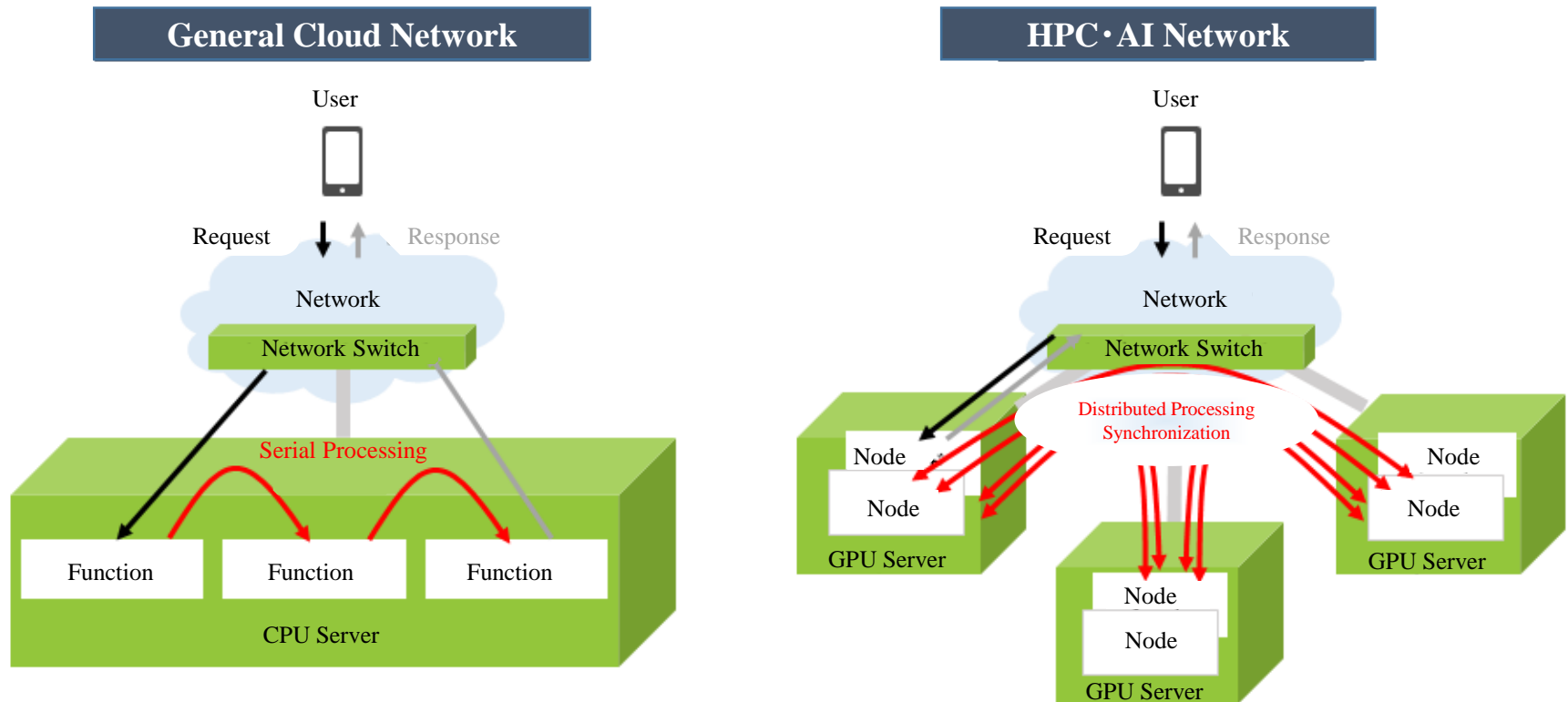


Source : LightCounting, January 2024 Optics for AI Clusters (2024/01)
Chart produced in-house based on the data above

2. Further Expansion of Data Center Market arising from AI Demand (3/3)

- Increased demand for optical cable/optical connectivity for AI-related facility
- High-speed data transmission occurs between GPU servers in AI-related facility
- To accommodate higher data transmission speed, GPU servers are optically interconnected thus this requires a large number of single-mode fibers

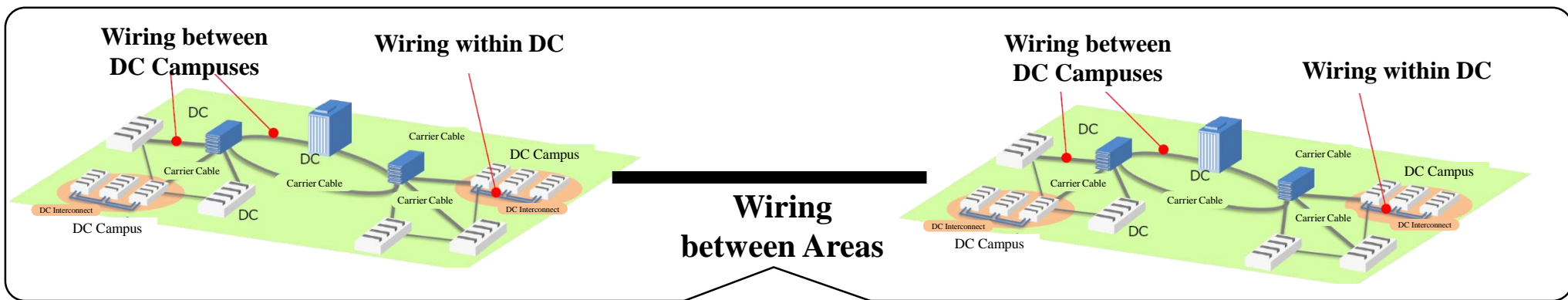
Difference in Optical Wiring Volume between CPU and GPU Servers



Source: macnica, How to Build a Server Network Considering Distributed Processing of AI (September 2021) (parts written by us)

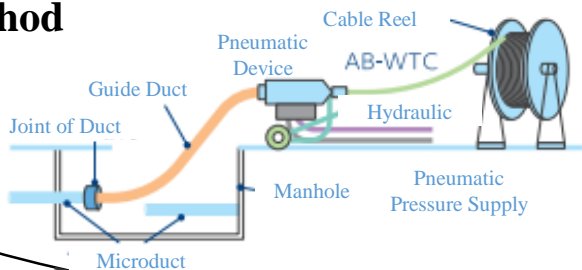
3. Necessity of Small Diameter and High Density : Strengths of Our Products (1/4)

- Support for DC-interconnect optical wiring (between areas)
- For optical cables connecting DC areas, there is an increasing need for small-diameter high-density air-blown WTC cables due to the efficiency of using cable laying ducts

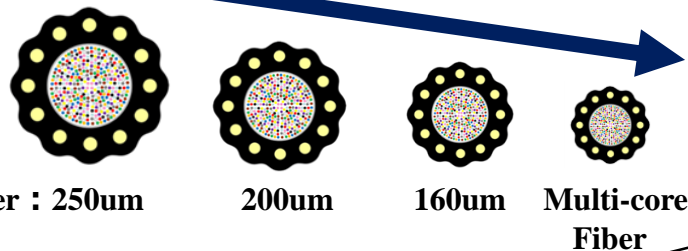


Air-blown - WTC

Air-blown Installation Method



Cable Slimming Technology



Fiber Diameter : 250um

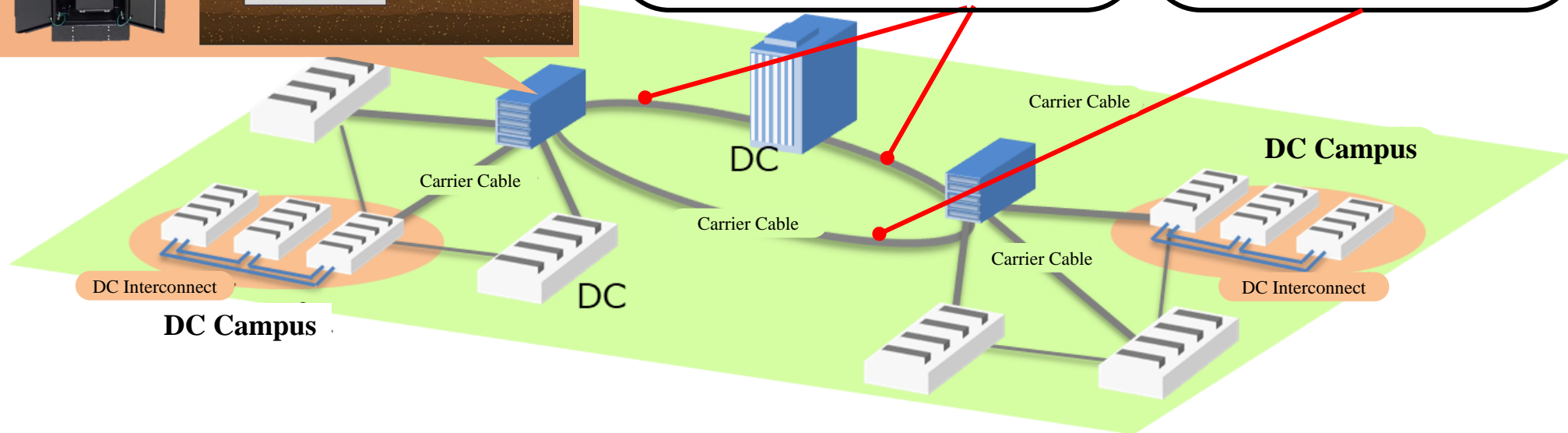
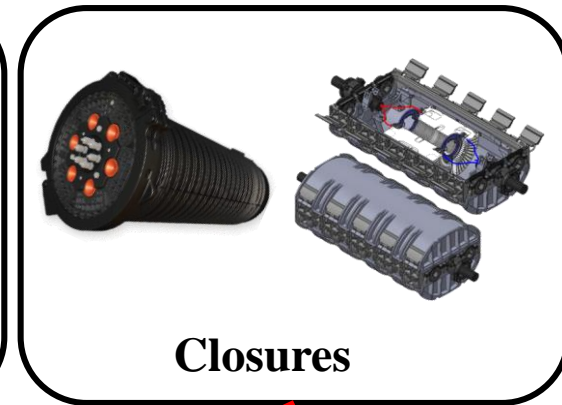
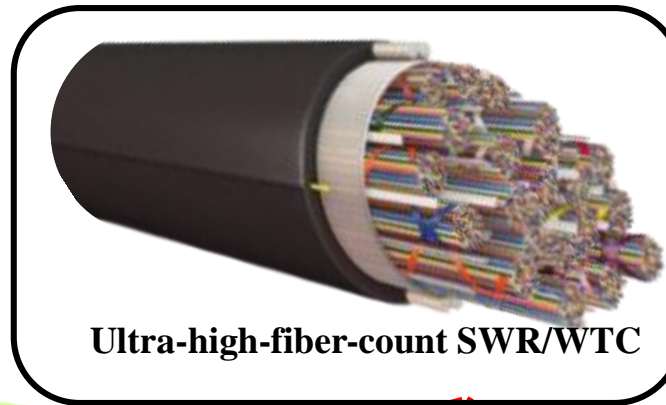
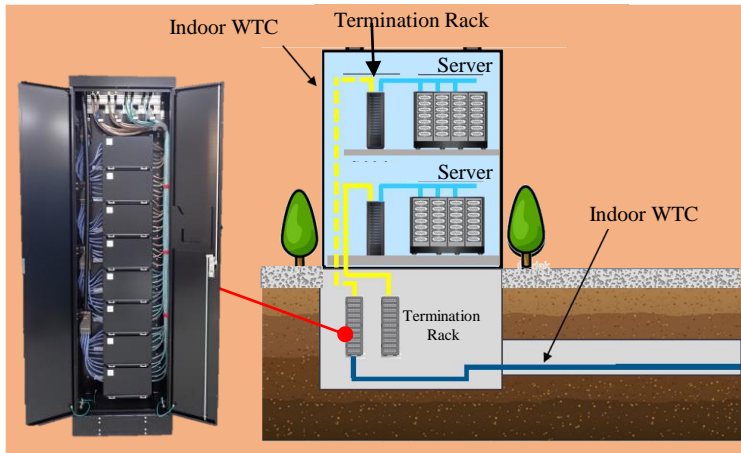
200um

160um

Multi-core
Fiber

3. Necessity of Small Diameter and High Density : Strengths of Our Products (2/4)

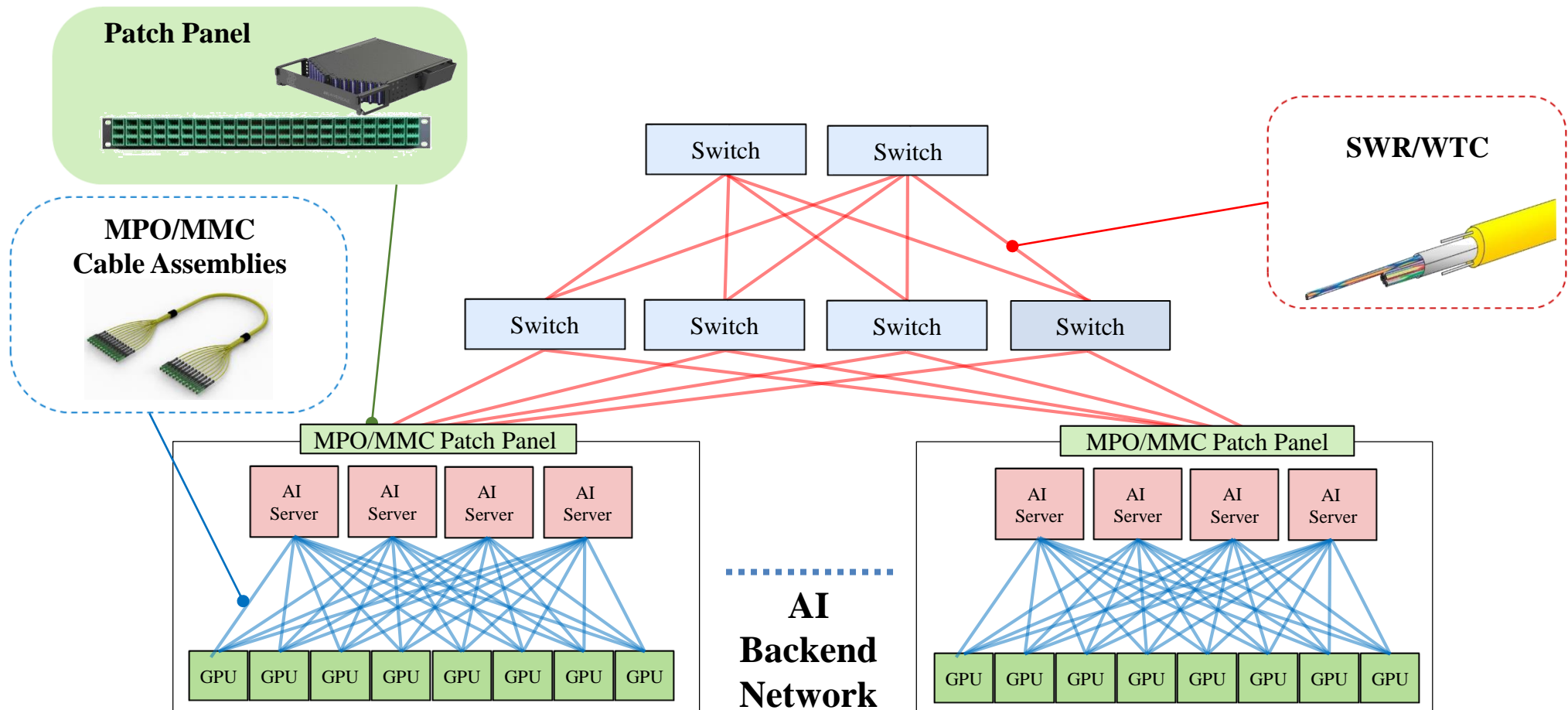
- Support for inter-DC optical wiring
- For optical cables connecting DCs with large campuses, there is an increasing need for small-diameter high-density WTC cables, closures, and terminated racks due to the efficiency of using cable laying ducts



Inter-DC Optical Wiring (DCI)

3. Necessity of Small Diameter and High Density : Strengths of Our Products (3/4)

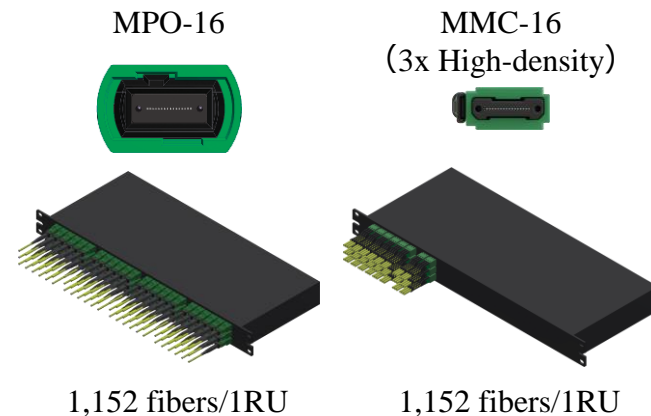
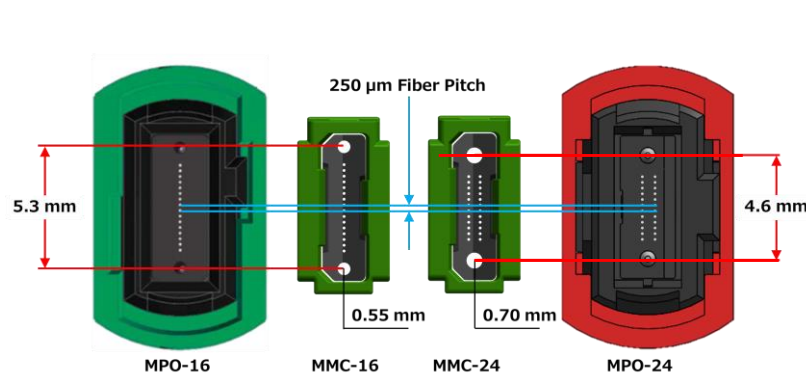
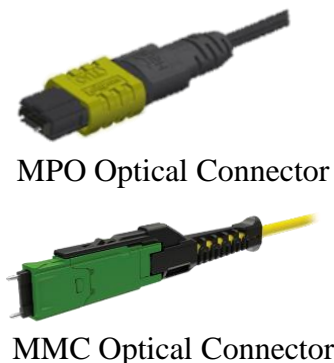
- Support for expanding intra-DC optical wiring
- Optical cross-connect interconnection between GPU Servers to perform the vast amount of processing required in AI with high capacity and low latency ⇒ Increased optical wiring volume
- Small-diameter, high-density wiring technology: Indoor SWR/WTC and MPO/MMC: Increasing need for compact multi-fiber connectors



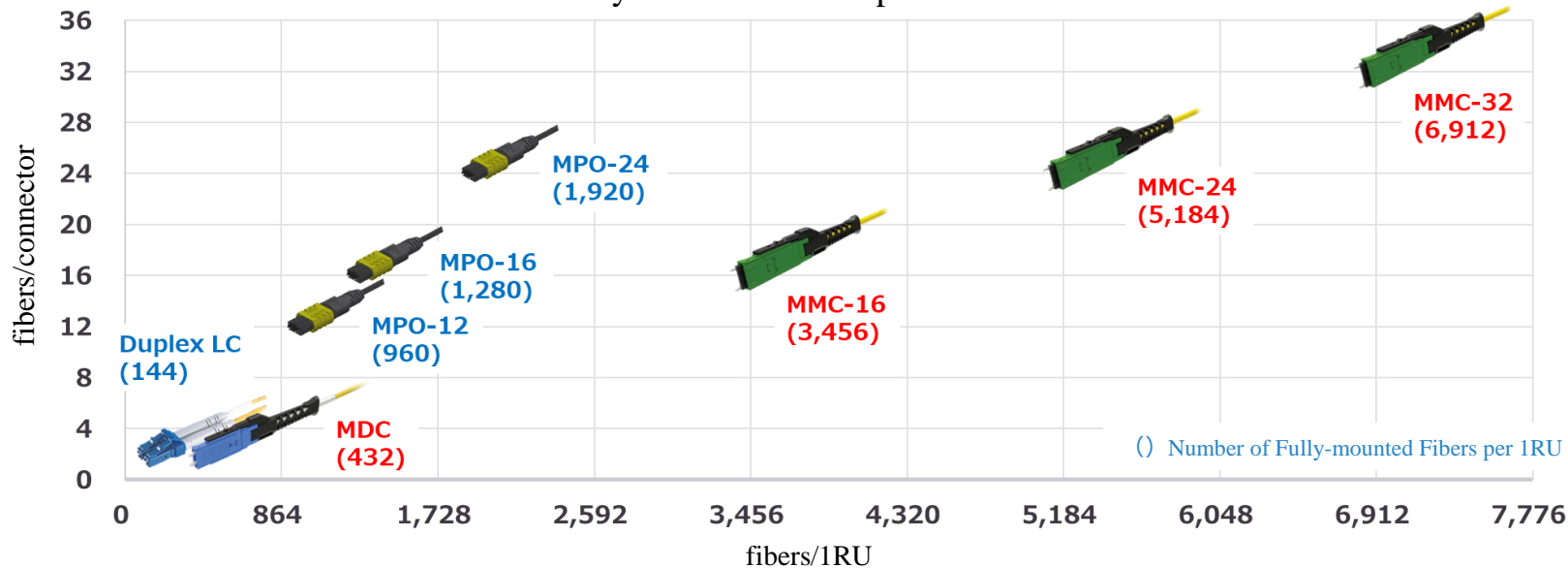
3. Necessity of Small Diameter and High Density : Strengths of Our Products (4/4)

- Next-generation ultra-compact MMC optical connectors

MMC optical connectors: Next-generation 3x high-density multi-fiber optical connectors based on proven international standard MPO optical connector basic technology

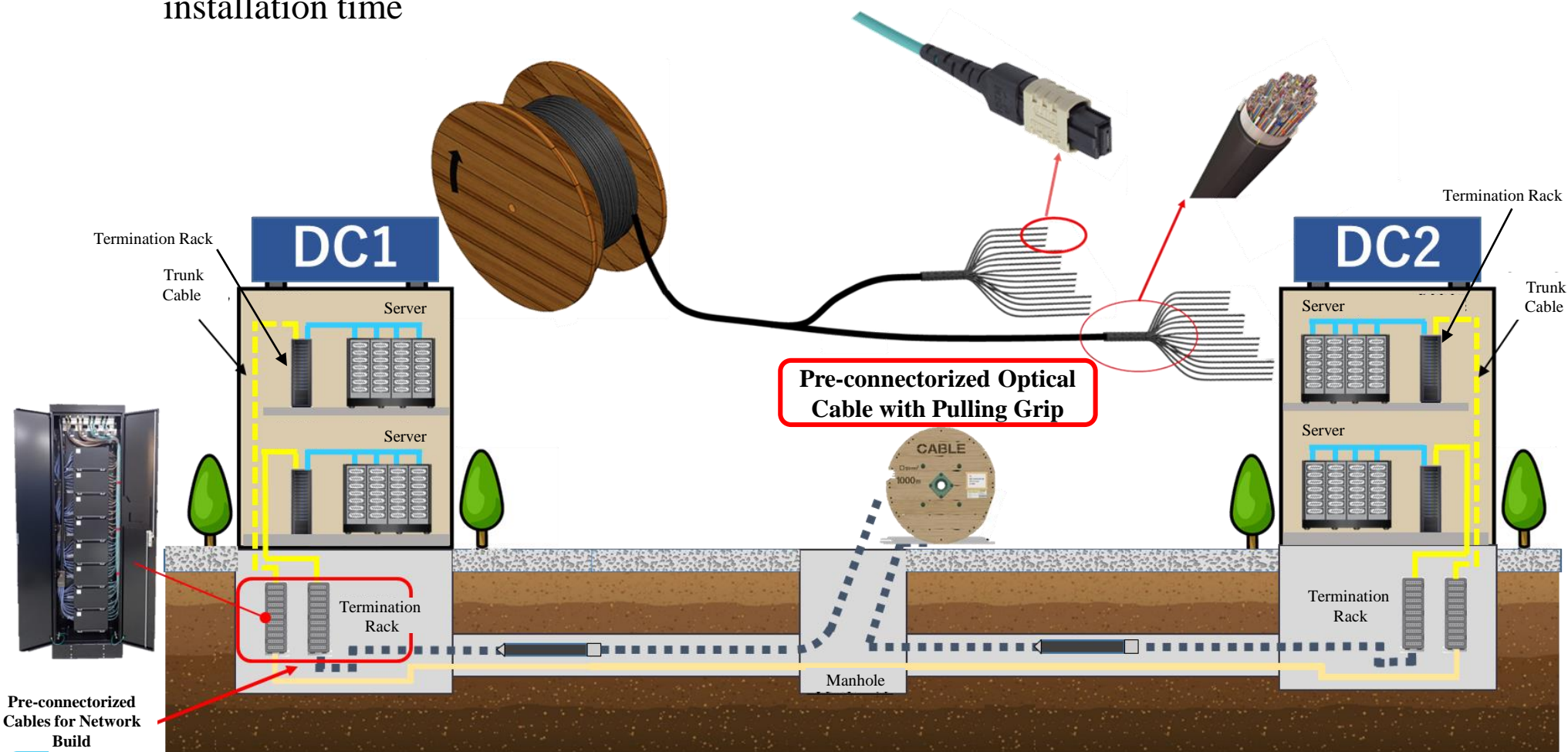


Number of Fully-mounted Fibers per Rack Unit



4. Addressing Workability Improvement (1/2)

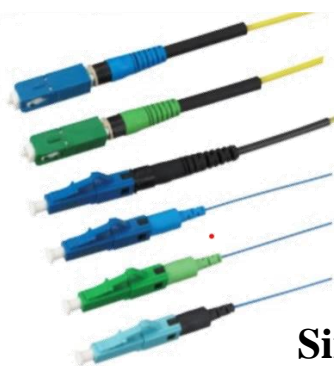
- Pre-connectorized optical wiring material
 - Rapid expansion of DC construction increases construction needs, but securing construction resources is a challenge
 - Pre-connectorized WTC with multi-fiber connectors with towing ends reduces on-site installation time



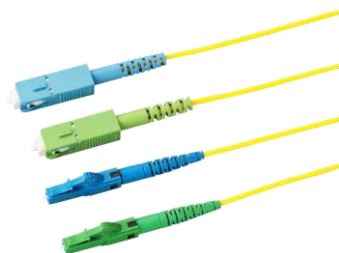
4. Addressing Workability Improvement (2/2)

- Single-fiber and multi-fiber fusion splice-on connectors for a variety of installation applications
- Optical connector cleaner to reduce work time

FuseConnect™ Splice-on Connectors



Single-fiber



Multi-fiber

Splicer



Multi-fiber



Single-fiber

Pen-type optical connector cleaner with excellent usability



New product with improved workability





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