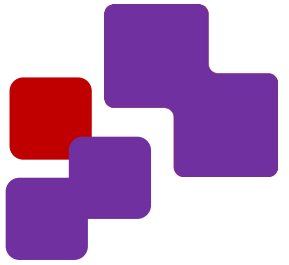




LASERWAY

*100% Optical Solution for  
LAN Networks*



 FURUKAWA  
ELECTRIC

A hand holding a glowing globe with a network overlay. The globe is blue and white, with a network of white lines and dots connecting various points across its surface. The background is dark blue with a faint network pattern. A red banner is on the left side of the image.

# FURUKAWA ELECTRIC GROUP

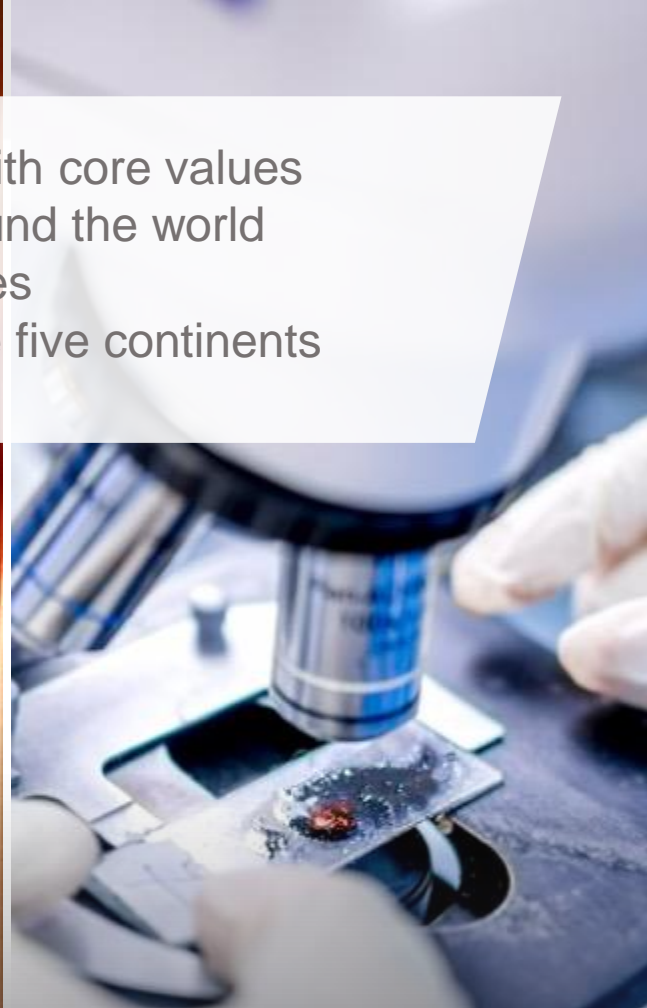
MAKING THE WORLD BRIGHTER

More than **130 years** expanding relationships, shortening distances and **anticipating technological needs** from the society.

**JAPANESE COMPANY** with core values  
**50.000 EMPLOYEES** around the world  
**+ U\$7 BILLION** in revenues  
**120 SUBSIDIARIES** in the five continents  
**ISO 9001, 14001, 18001**



**SOLIDITY**



**KNOWLEDGE**

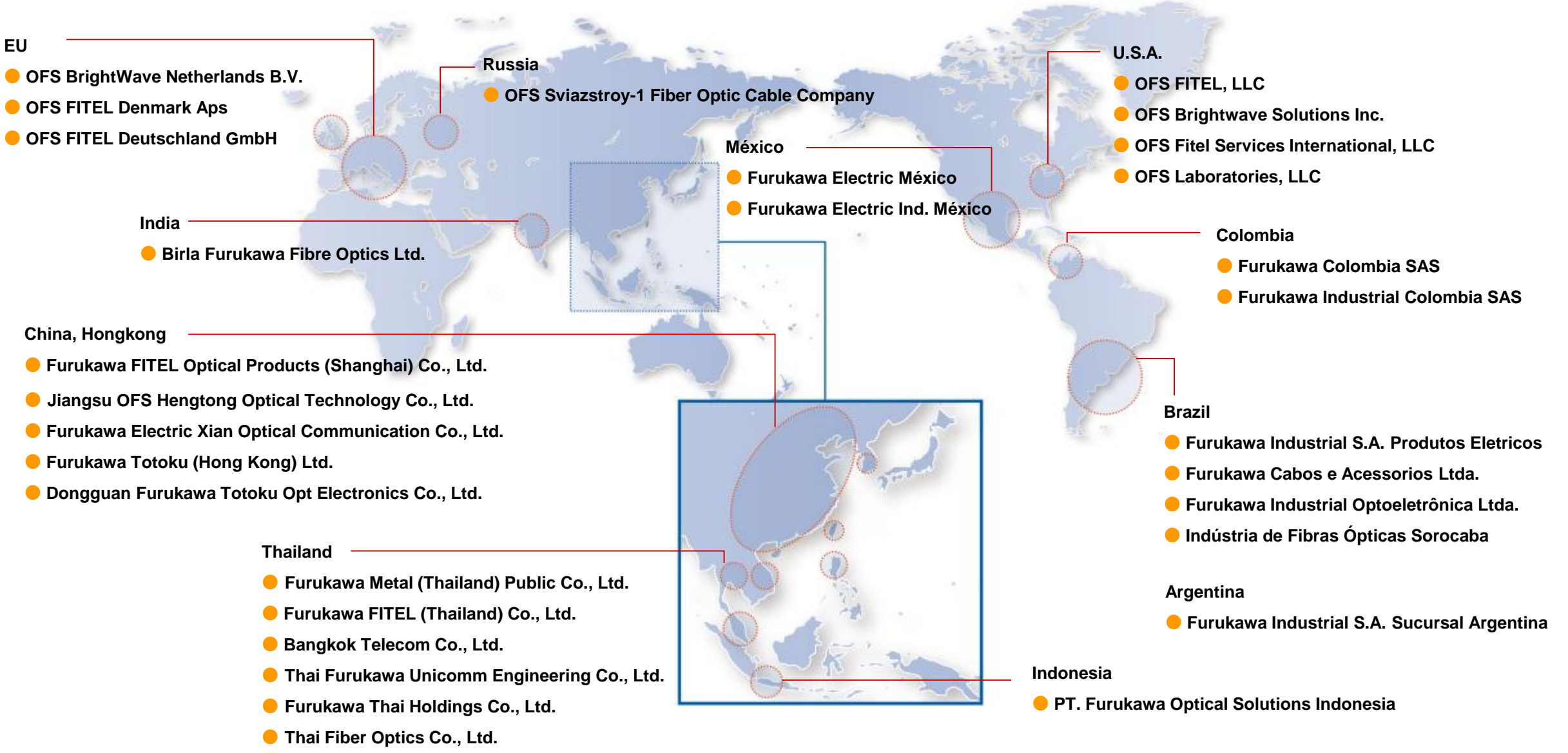


**INNOVATION**



**EXPERIENCE**

# Furukawa Electric Global Network - Communications Solutions



## Challenges of Actual Infrastructure

*Better Use of Resources*

*More Security*

*Better Quality of Service*

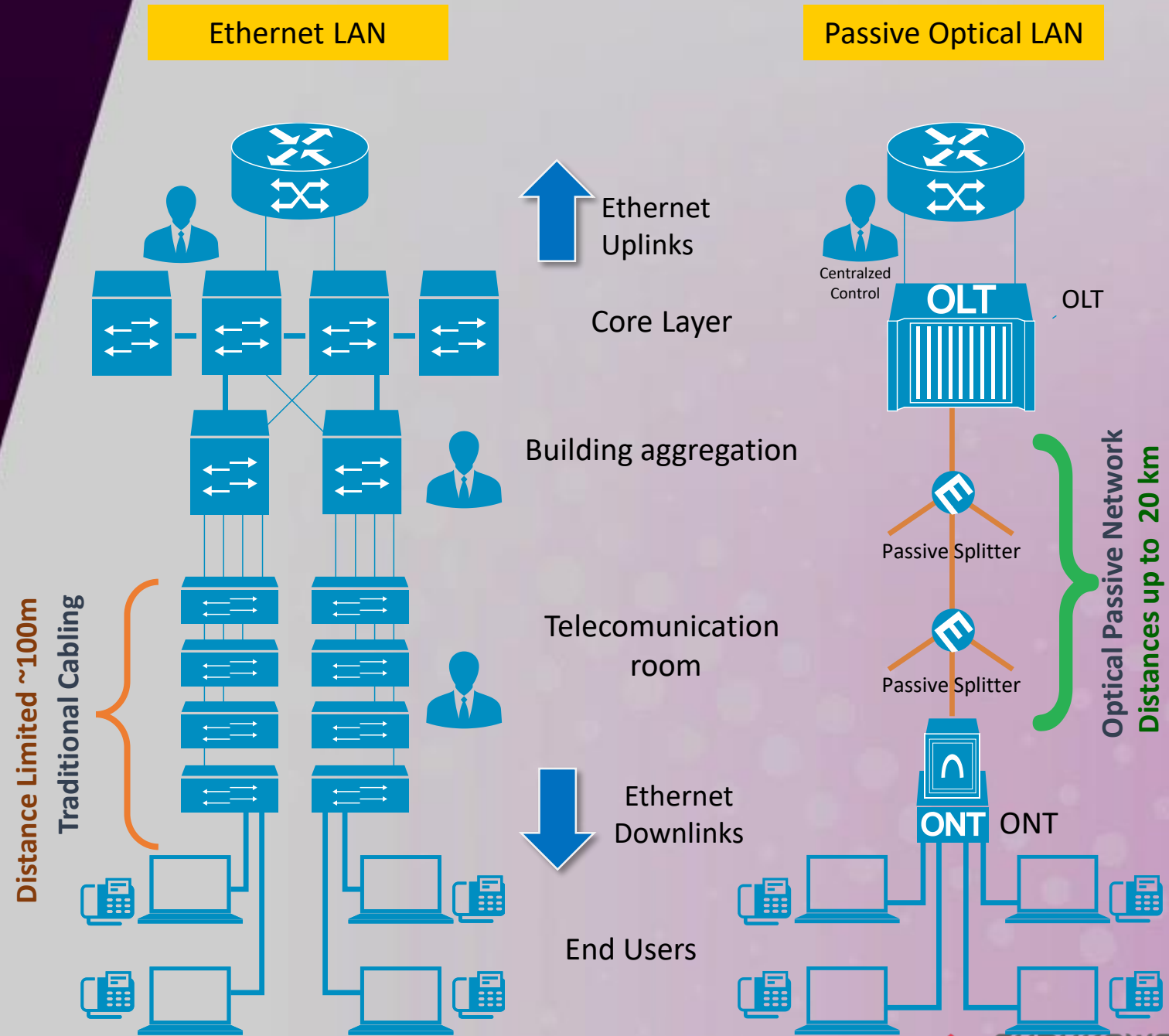
*More Performance and Faster*



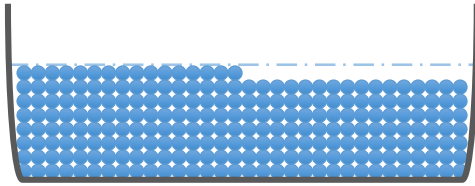
# PASSIVE OPTICAL LAN

## CONCEPT

CENTRALIZATION  
SIMPLICITY  
ECONOMY  
FLEXIBILITY



## Occupancy Simulation: Raceways and ducts



240 Cat.6 Cables  
Weight per Cable: 42 Kg/Km  
Total 100m = 1008Kg

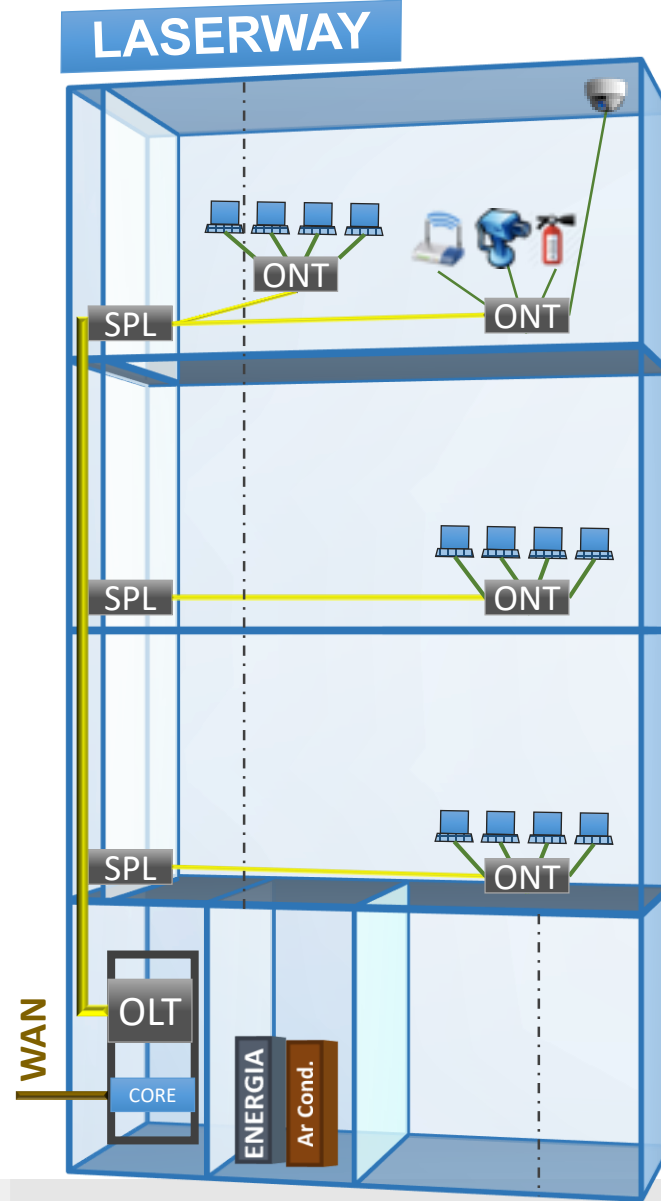
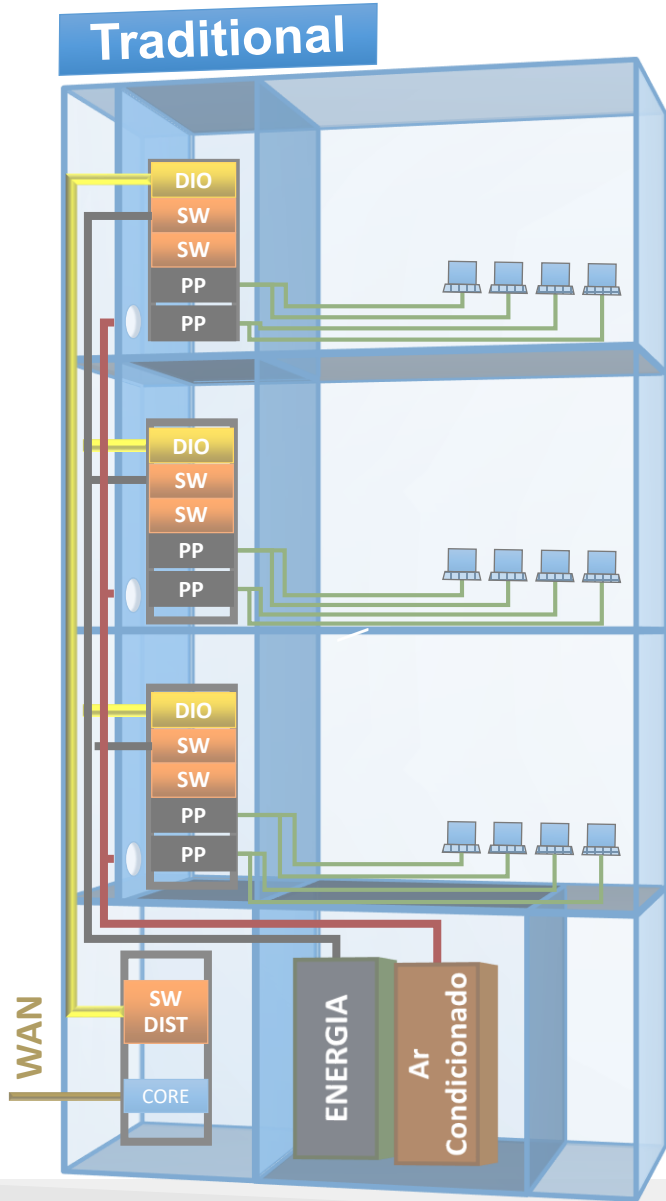


5 MPO Pre-con 12 FO Cables  
Space < 97%  
Weight per Cable: 40 Kg/Km  
Total 100m = 20Kg (<98%)



60 Patch Cords SC Pre-con 01F  
Space < 87%  
Weight per Cable: 10 Kg/km  
Total 100m = 60Kg (<94%)





**Up to 25%  
LESS CAPEX**

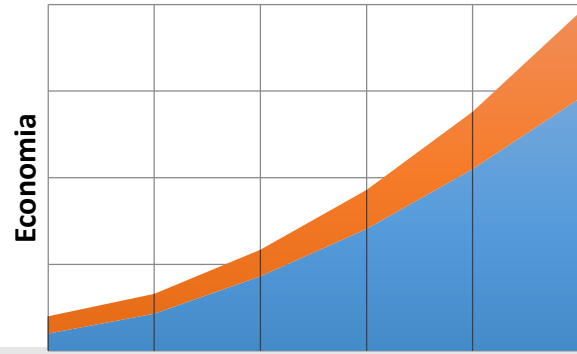
**95% LESS ACTIVE  
PORTS**

**69% LESS CABLES**

**GREEN, 87% LESS PLASTIC  
USAGE**

**REDUCED INSTALLATION  
TIME**

**REDUCED INSTALLATION  
COSTS**



**Up to 70%  
LESS OPEX**

**70% LESS ELECTRICAL  
POWER CONSUMPTION**

**LOWER COST OF IT  
MANAGEMENT**

**5 TIMES INCREASE  
NETWORK LIFETIME**

**UP TO 70%  
SPACE SAVING**

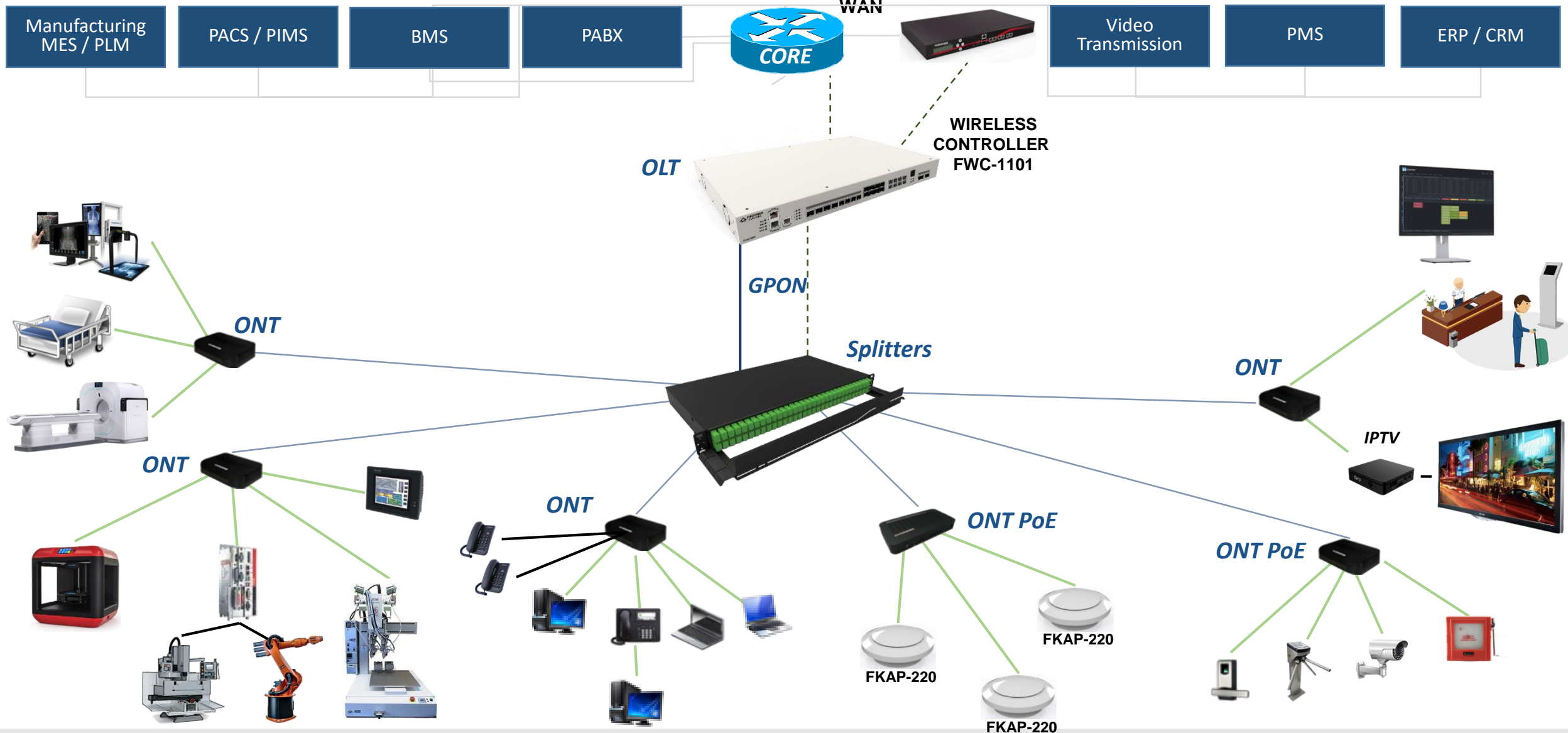
**33% LESS RACK  
OCCUPATION**

**89% LESS EQUIPMENT  
ROOMS (M<sup>2</sup>)**

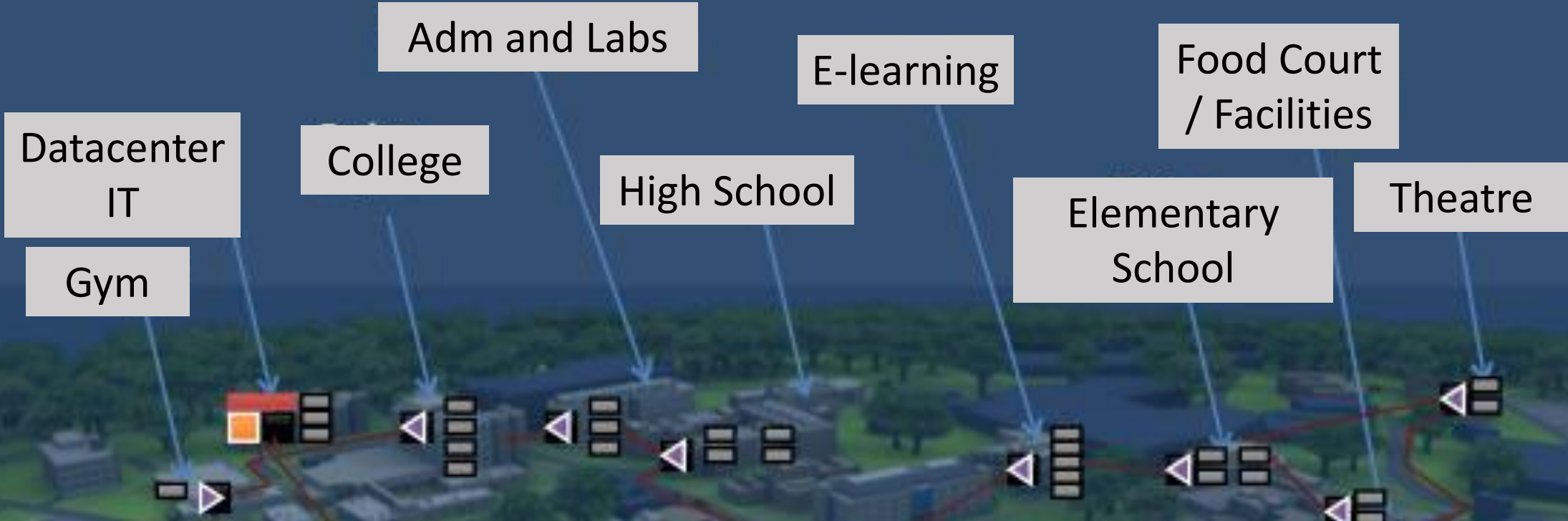
**IMPROVE USE  
OF SPACE**



# Laserway Networks Aggregated Value



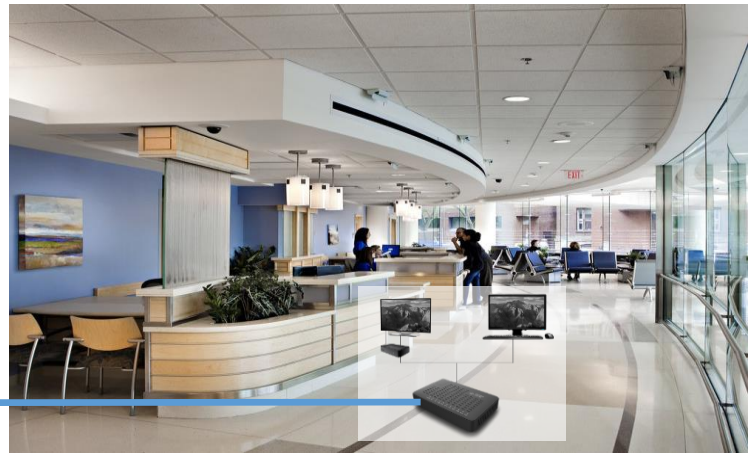
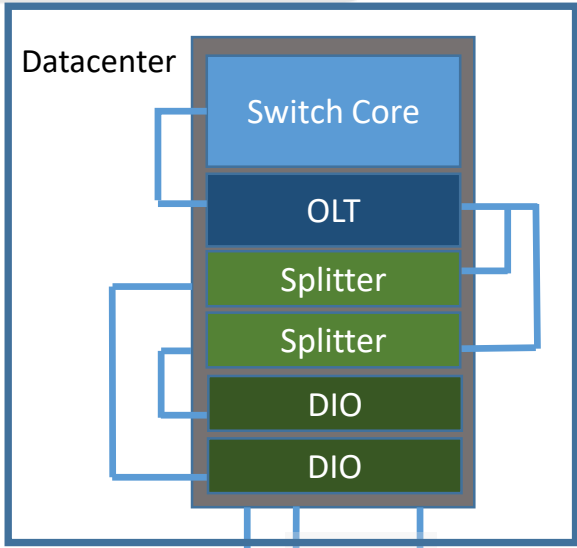
# Campus: Infrastructure Advantages



Improvement of Network Control  
EMI Immunity  
Space usage optimization  
Energy consumption reduction

Trad.	LW
Ativos	Ativos
Passivos	Passivos

# Facilities Diversity



Passive Rack



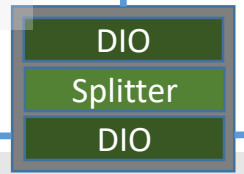
Passive Rack



Opt  
Cable  
SM  
BLI  
Precon  
MPO

No fusion splicing required  
Lower cost of installation  
Lower cost of maintenance  
Lower cost of infrastructure

Passive Rack  
(No energy, no cooling and  
no configuration required)



# Concepts and Infrastructure

The entire Laserway solution is based on **structured cabling technical references** and **normatives** aiming to standardize the project development and installation.

ANSI/TIA-568.0-D

ANSI/TIA-568.1-D

ANSI/TIA-568.3-D

ANSI/TIA-606

ITU-T G.984

TDMM 13 - Backbone (Cabling Subsystem 2) and Horizontal Cabling (Cabling Subsystem 1)

## Passive Network Optical Division

**1** SERVICE INPUT

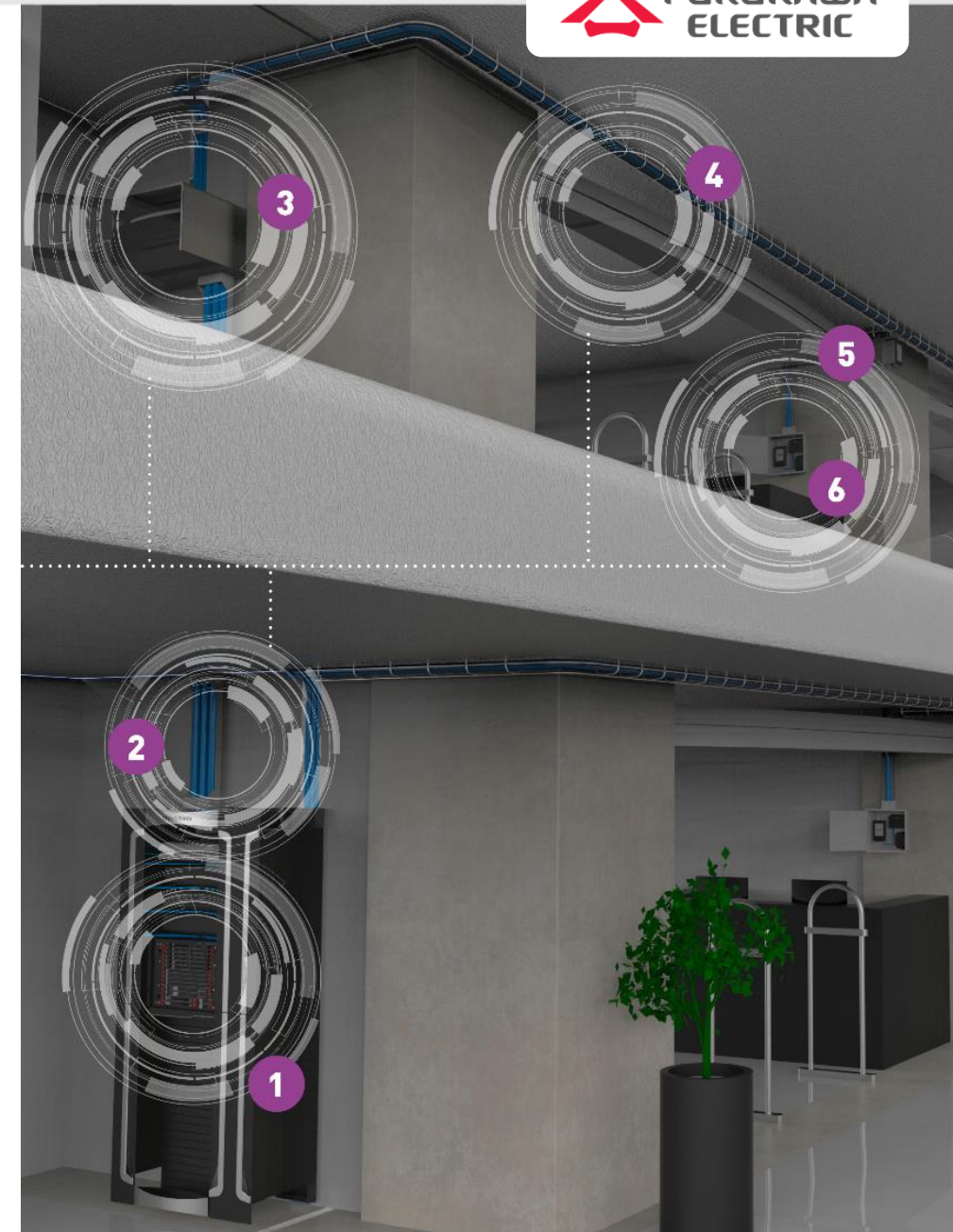
**1** EQUIPMENT ROOM

**2** BACKBONE  
(PRIMARY CABLING)

**3** TELECOMMUNICATION ROOM / CABINET

**4** **5** HORIZONTAL  
CABLING

**6** WORK AREA / OPTICAL TERMINATION





*In this topology, the optical splitters are centralized in the Equipment Room.*

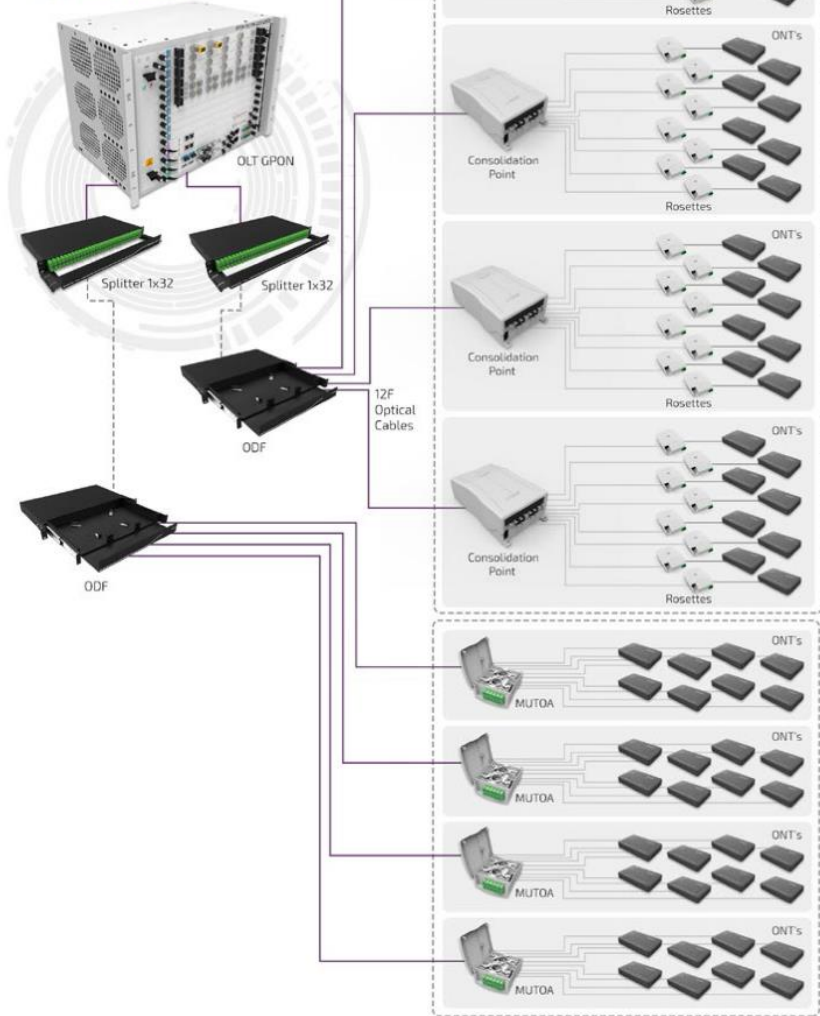
*Network flexibility.*

*100% of the splitter ports used.*

*From the Equipment Room, it is a point-to-point network.*

*Centralized Topology*

**Data Center Equipment Room**



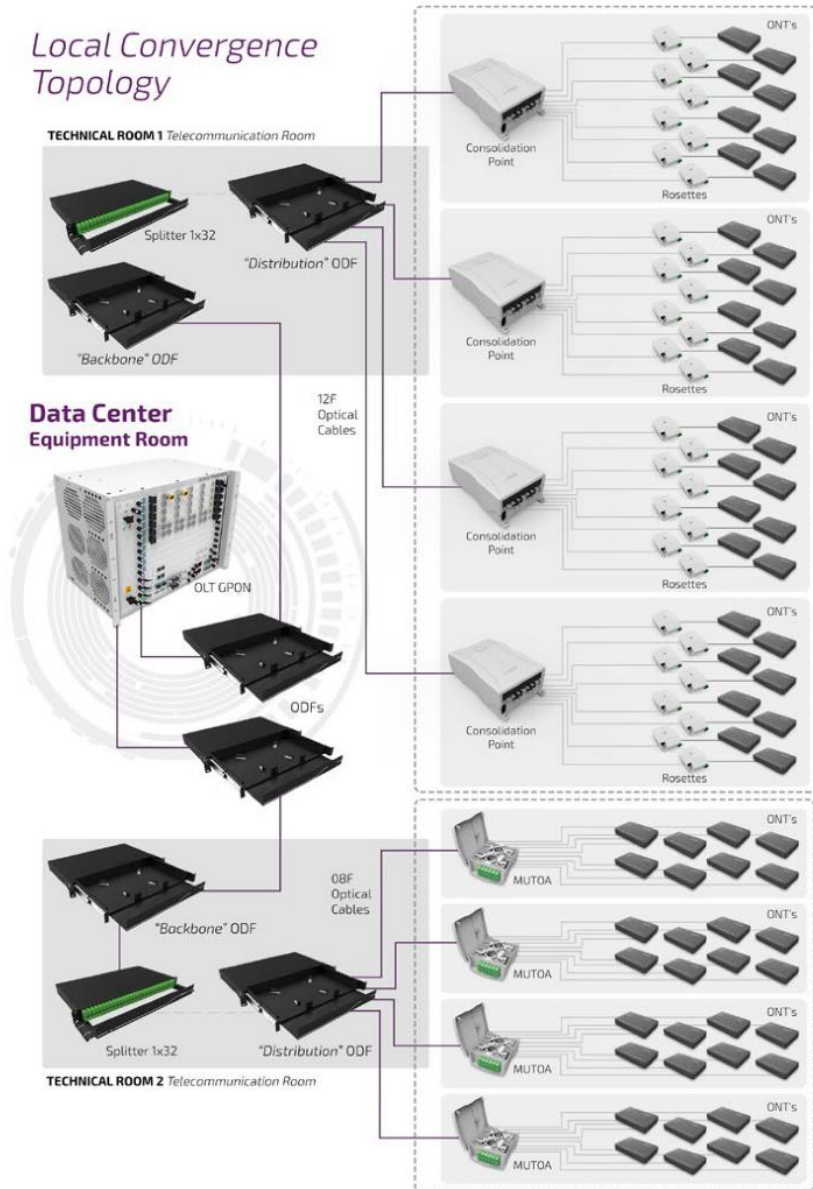
# Local Convergence Topology



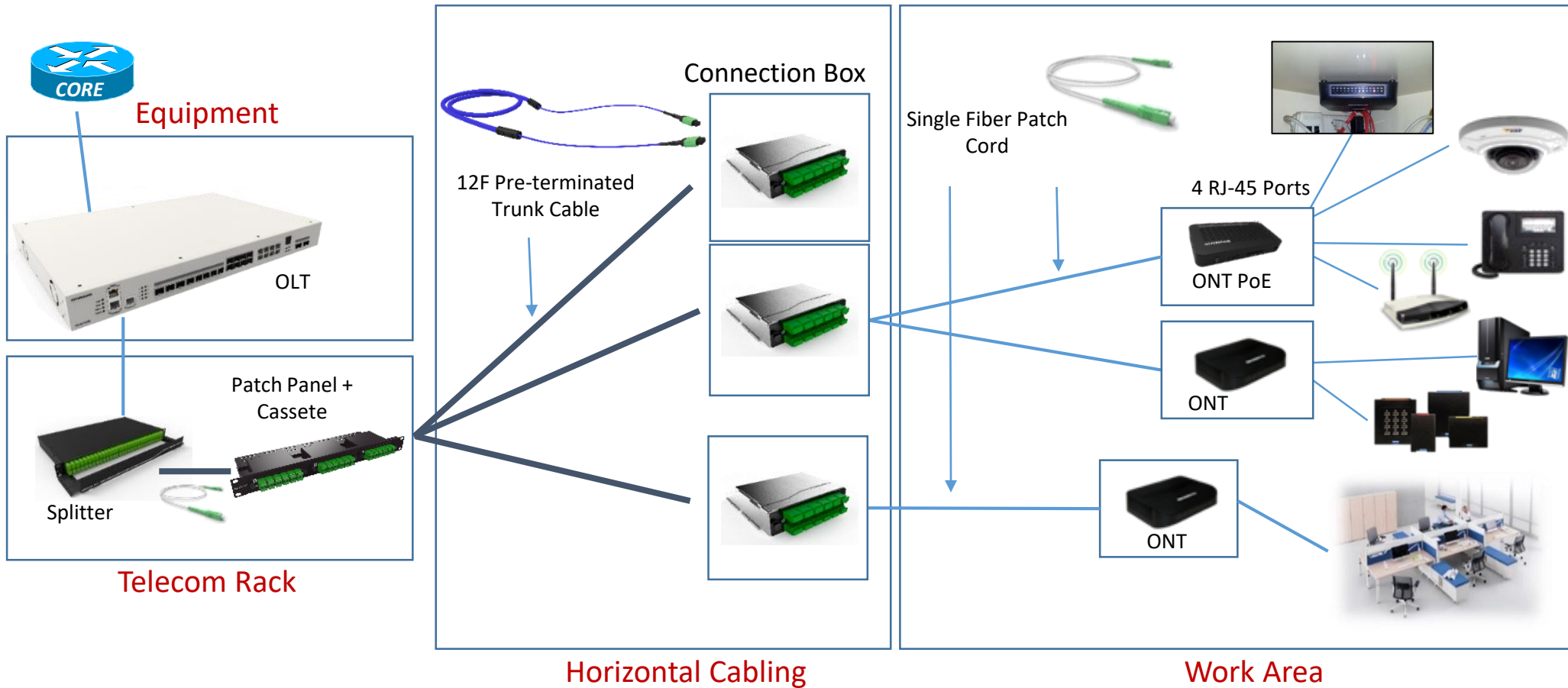
*The optical splitters are installed in the telecommunication rooms/cabinets.*

*Backbone fiber reduction.*

*Point-to-point networks from the Telecommunication Room.*



# Pre-terminated Solution



Topology in accordance with international structured cabling standards.



- **Simplified Topology**
- **Quick and Easy Installation**
- **No need for splices or connectorization**
- **Flexible and facilitated expansion**
- **Reduced space on technical rooms and infrastructure**
- **Less equipment to manage**



*Enterprise Open Rack*



*Enterprise Closed Rack*



*Optical Concentrator  
GPON LD3032*



*GPON and Uplink Transceivers*

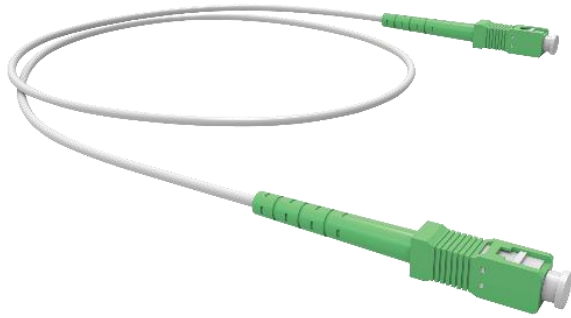


*Wireless FWC-110 Controller*



*Optical Concentrator  
GPON FK-OLT-G8S*





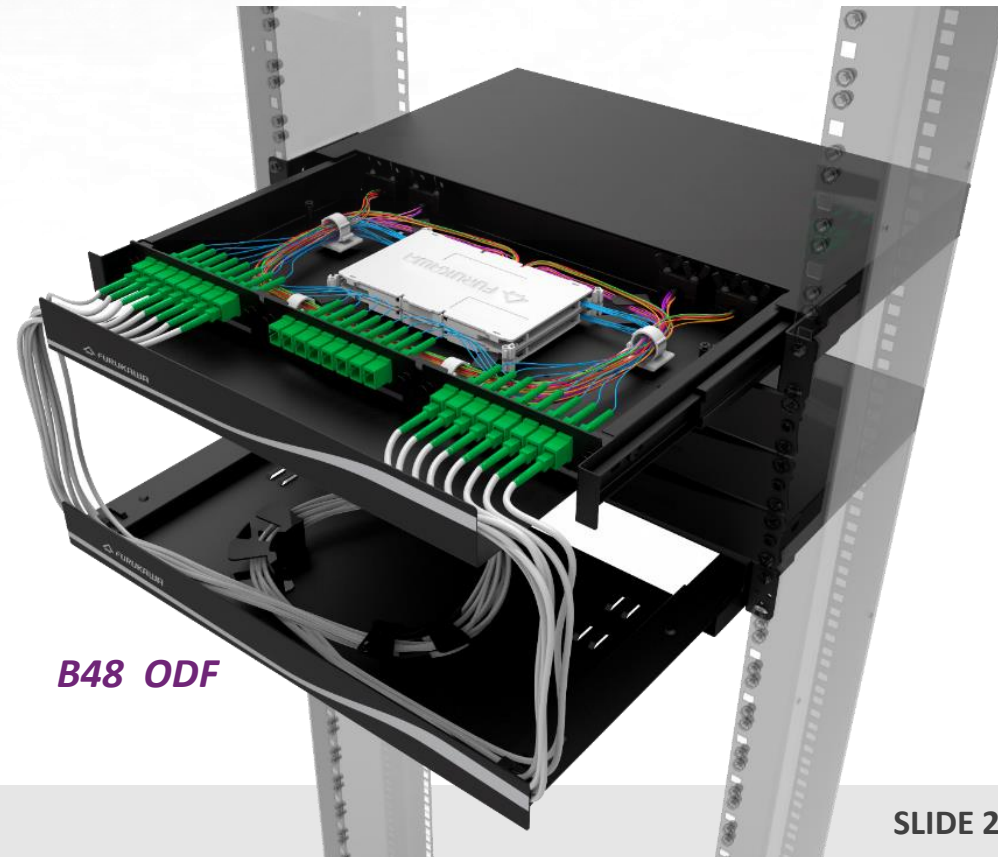
*BLI Optical Cord*



*Patch Panel LGX*



*Modular Splitter 19"*



*B48 ODF*



*Enterprise Rack*



*Modular Splitter 19"*



*Patch Panel LGX*



*Direct/Reverse LGX Cassette*



*Horizontal Cable Guide*



*BLI Optical Cord*



*B48 ODF*



**LGX Connection Box  
and LGX Cassette**



**Trunk Cable**



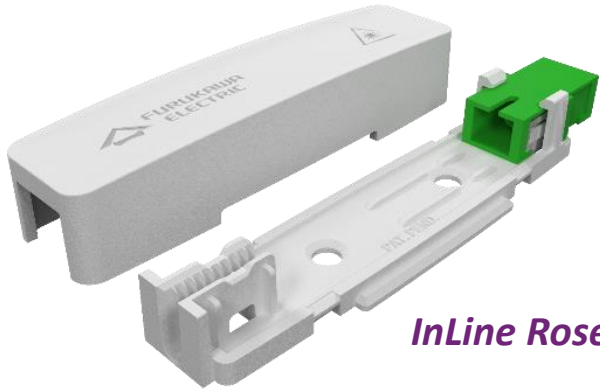
**Low Friction + EZ!Connector**



**Slimbox™ 12F (CEIP 12)**



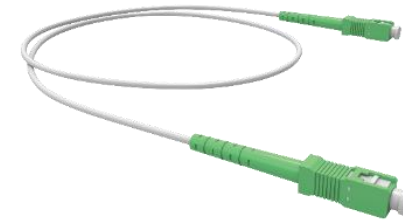
**Fiber-Lan + EZ!Connector 0.9**



**InLine Rosette**



**Internal Access Point FKAP-220**



**Optical Cord BLI SC-APC/SC-APC LSZH**



**Patch Cord CAT.6**



**ONT - G400B / PoE S2**



**ONT LD110-44B**



**ONT LD422-10R**

Browser: 10.80.42.88/icingaweb2/iframe?url=http://10.80.42.88/smartmoon/index.php/emailconfig

### SMTP Server Configuration

Secure:  SSL  TLS  None

Host:  Port:

Username:

Password:

### Email Test

Email:

- Dashboards
- Device Syslog
- Device Discovery
- OLT Management
- ONU Management
- System Detail
- Configuration
  - Authentication
  - SMTP Server**
  - About
  - My Account
  - Logout

### ONU Discovery

OLT:

✔ Conducting the discovery of ONUs...

✔ Checking ONUs already discovered...

256	0	256	12
-----	---	-----	----

- Dashboards
- Device Syslog
- Device Discovery
- ONU**
- OLT Management
- ONU Management
- System Detail
- Configuration
- About
- My Account
- Logout

### OLT\_001\_LTS\_LAB\_135 Detail - ULI Overview

Last 1 hour Refresh every 30s

OLT Stat	CPU Load	Memory Usage	Traffic Ge_11_3	Total ONUs	Active ONUs
Active	12%	24%		0	0
				Inactive ONUs	Blocked ONUs
				0	0

- Dashboards
- Device Syslog
- Device Discovery
- OLT Management
- ONU Management
- System Detail
- Configuration
- About
- My Account
- Logout

- > OLT GPON 1/1 Detail (14 hidden panels)
- > OLT GPON 1/2 Detail (14 hidden panels)
- > OLT GPON 1/3 Detail (14 hidden panels)
- > OLT GPON 1/4 Detail (14 hidden panels)
- > OLT GPON 2/1 Detail (14 hidden panels)
- > OLT GPON 2/2 Detail (14 hidden panels)
- > OLT GPON 2/3 Detail (14 hidden panels)
- > OLT GPON 2/4 Detail (14 hidden panels)
- > OLT GPON 3/1 Detail (14 hidden panels)
- > OLT GPON 3/2 Detail (14 hidden panels)

The screenshot displays the Laserway Manager web interface across three overlapping browser windows, illustrating the configuration process for VLANs.

- Top Window (10.80.43.18/onus):** Shows the main dashboard with a sidebar menu containing Dashboard, OLTs, ONUs, Configurações, Sites, Racks, Vlans, and Tipos de Serviços.
- Middle Window (10.80.43.18/vlan/new/double):** Displays the "Adicionar Vlan" form with fields for "Tipo", "Nome VLAN", and "Descrição".
- Bottom Window (10.80.43.18/plan/1):** Shows the configuration for a specific plan, including a table for port settings and two tables for VLANs.

Porta	Porta Habilitada	PoE	Port Duplex	Port Speed	Rate Limit	Max Frame	Max Hosts
Lan 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Auto	Auto	Ilimitado	Padrão	Ilimitado
Lan 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Auto	Auto	Ilimitado	Padrão	Ilimitado
Lan 3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Auto	Auto	Ilimitado	Padrão	Ilimitado
Lan 4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Auto	Auto	Ilimitado	Padrão	Ilimitado

Nome	VID	CoS	Tag Type	CoS Oper	LLDP	Portas LAN				Ações
						Lan 1	Lan 2	Lan 3	Lan 4	
teste12	40	0	Marcado	ANY	SIM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
teste13	50	0	Marcado	ANY	NÃO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Nome	VID	CoS	CoS Oper	Protocolo	Método
IPOST	2002	5	ANY	IPv4	DHCP

## Case Enjoy Olímpia Park Resort

“

*Flexibility for expansions and high quality of communication provided by fiber optics are the main attractions of GPON technology.*

”

*Paulo Eduardo Velho - EPOLD*

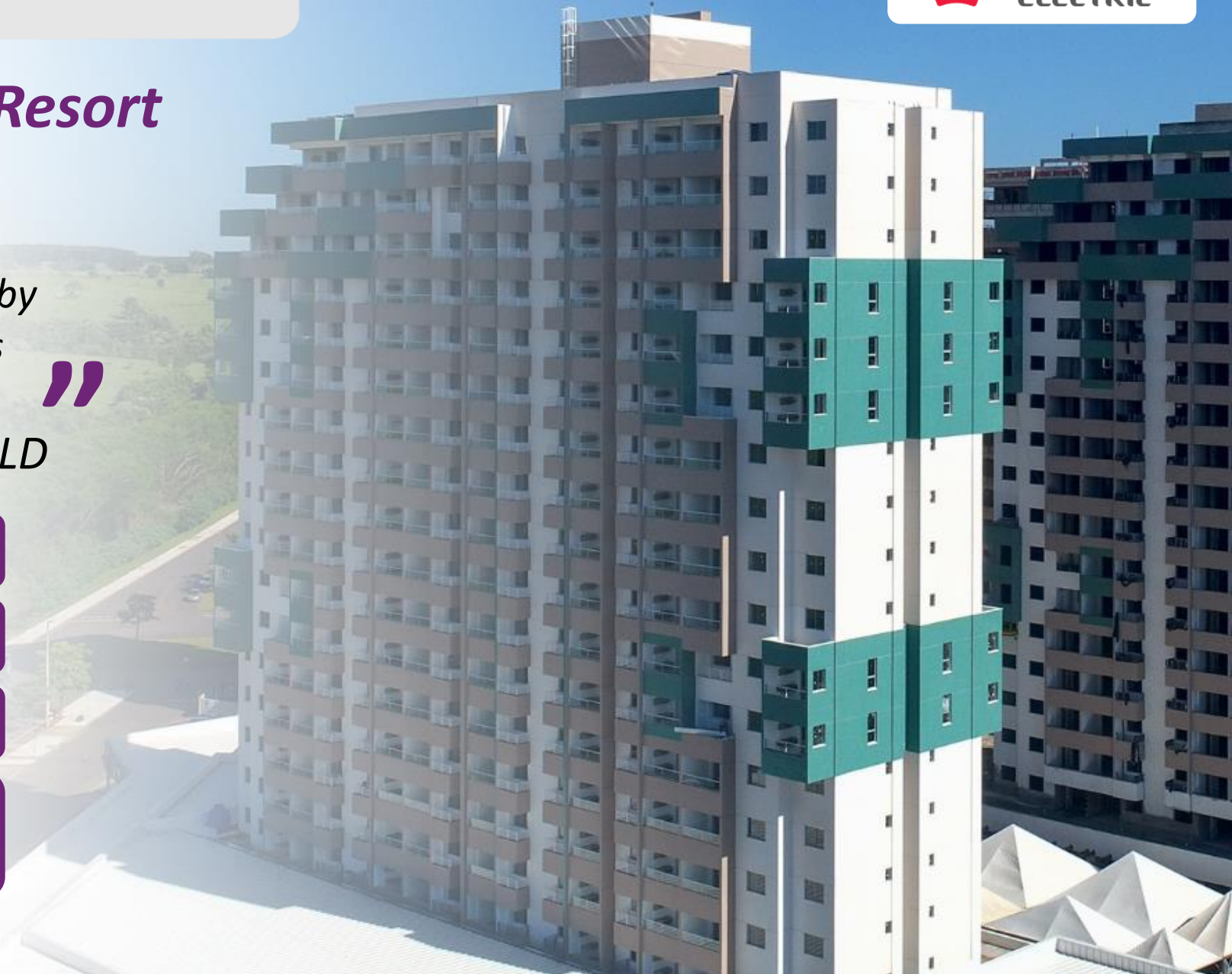
*912 apartments\**

*84.000 square meters*

*GPON Laserway Solution*

*GigaLan MAX Green  
Ecofriendly Solution*

*\* When the construction is completed.*



## Preliminary Study: Traditional Solutions vs x Laserway \*

Project: **OP Resort - SP/Brazil**

Network Ports 1568

Total Number of Floors 68

4 buildings with 17 floors each

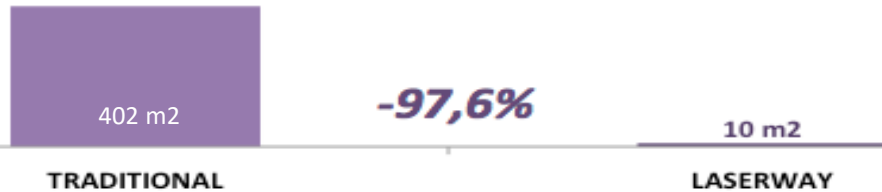
### CAPEX (R\$)



### OPEX: Annual Energy Savings in IT Infrastructure



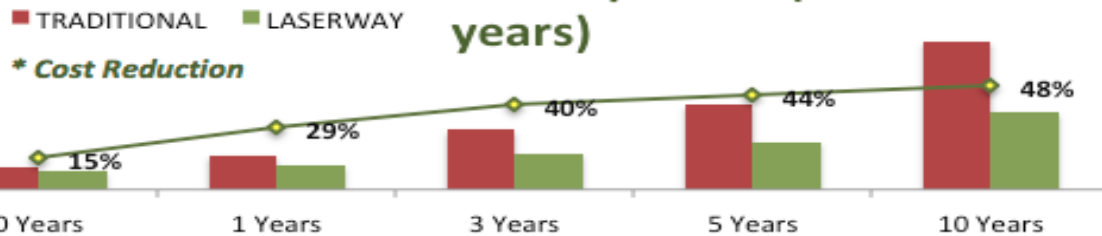
### Space Utilization (m2)



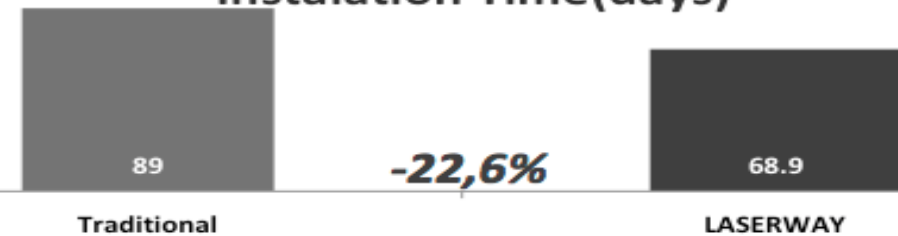
### OPEX: Estimate Saving in IT Management Costs



### Total Cost of Ownership - TCO (0 to 10 years)



### Installation Time(days)

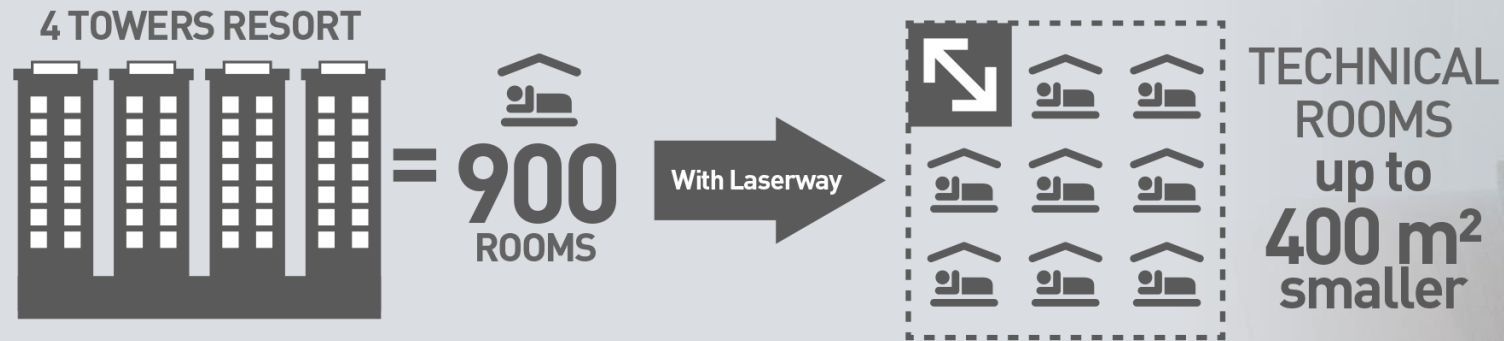


\*Preliminary Study using average market data and general topologies. For a more specific and detailed study an executive project must be made as well as a detailed survey of the project. CAPEX includes material costs, service costs, infrastructure and support services. OPEX includes Energy costs, real estate costs and estimated IT management costs). Real estate costs can be OPEX or CAPEX depending on the project specifications. Centralized Laserway Network vs Gigabit Traditional network with switches. TCO (Total Cost of Ownership) = CAPEX + OPEX times number of years.



## Advantages for your business and guests.

### Laserway



$$400 \text{ m}^2 = \underbrace{+8}_{\substack{\text{50 m}^2 \\ \text{room}}}} \times \underbrace{150 \text{ USD}}_{\text{DAILY AVERAGE}^*} \times \underbrace{5}_{\text{YEARS}} = \underbrace{1,5 \text{ M USD}}_{\text{EXTRA REVENUE}}$$

\* Considering an occupation rate of 70% per year.

# OUR CUSTOMER EXPERIENCE



Silao Guanajuato - Mexico



Irapuato Guanajuato - Mexico



Guadalajara Jalisco - Mexico



Olimpia - Brazil



Olimpia - Brazil



Playa del Carmen - Mexico



Campos do Jordão - Brazil



Aguas de Sao Pedro - Brazil



Intercontinental - Mexico



Los Cabos - Mexico

## *Premium Support Service 24x7*

**Remote technical support at any time, 7 days a week** upon SLA (Service Level Agreement) at service level N1 to N3, according to the criticality level of the occurrence.



## *On-Site Service Pack for Equipment / Laserway*

Upon acquisition of the service pack, the customer will have **32 hours for start-up, training and assisted operation for equipment.**

## *Service FSS 3Y 8x5 Plus*

**Maximize the benefits of IT investments**, for the structure to remain the most stable as possible, contributing to achieve business goals and projects, such as reduction of operational costs and transferring human resources to other priority tasks.



## Qualification and Continued Education Program

*Furukawa has been gradually innovating the training model and aiming at professional specialization, it develops trainings supported by universities, instructors and technological partners, in order to optimize the qualification time and increase the professional knowledge.*

*Laserway Concepts and Projects (16h)*

*Laserway Equipment (16h)*



**Partnership with Universities**  
Professional Specialization

**236**

**Hours In-Person Courses**  
Experience

**20**

**Years**  
+70,000 Professionals trained

**Bicsi**

**Building Industry Consulting Service International**  
International Recognition

# Furukawa Extended Warranty

*The Program guarantees that Furukawa together with its installers and distribution channels deliver a high quality network, assuring its functioning into multiple applications and equipment at high rate and availability for a long period of time, optimizing the investment.*

**TO OBTAIN THE EXTENDED WARRANTY, THE END CUSTOMER SHALL REQUEST IT TO ITS FURUKAWA SOLUTION PROVIDER (FSP) OF HIS PREFERENCE, WHICH WILL START THE PROCESS AT FURUKAWA.**



**25  
YEARS**

Reliable Passive  
Optical Network



**Higher  
Performance**

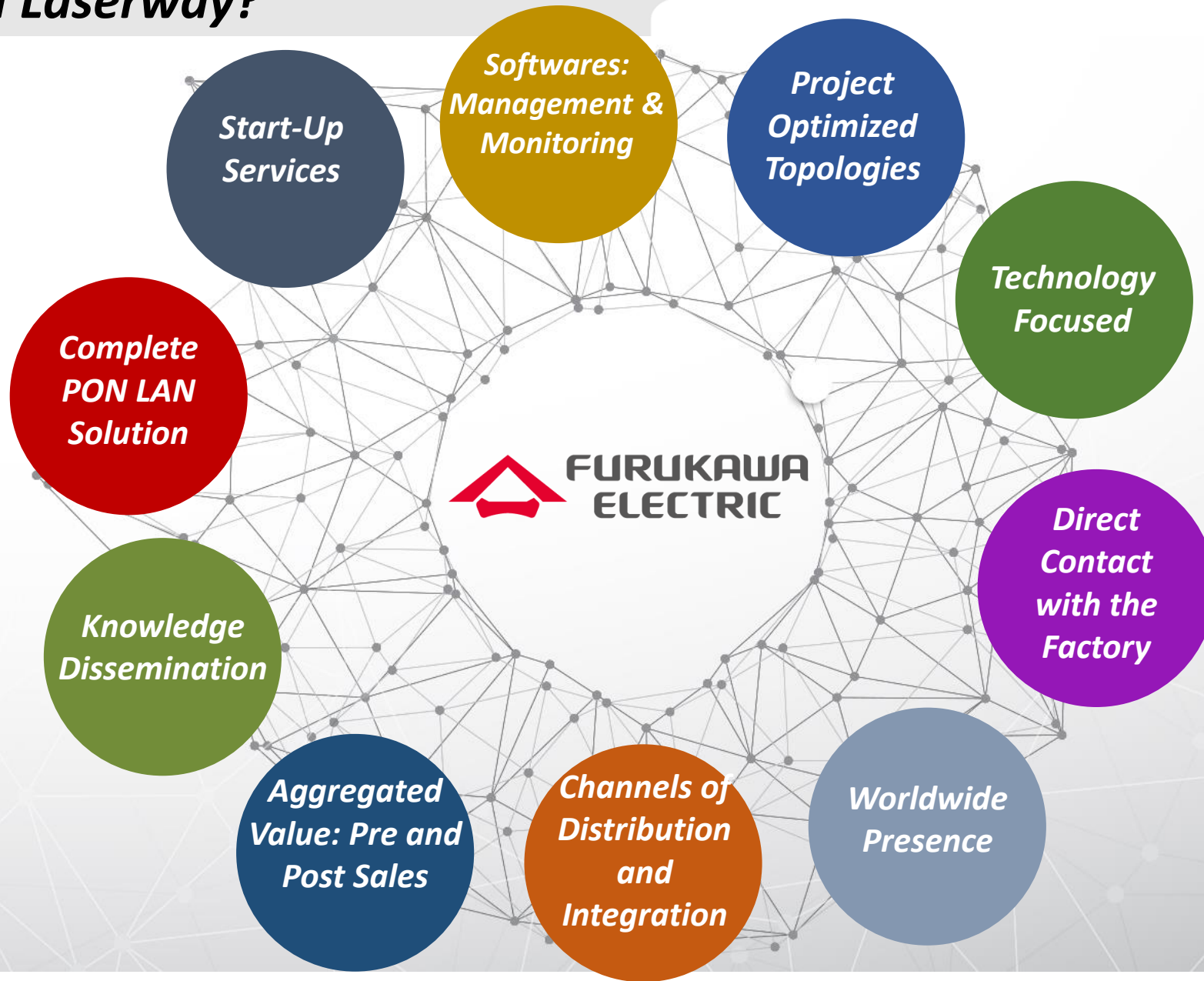
Complete Certification  
of the Passive Optical  
Network



**Response Time  
Reduction**

Modifications or  
Expansion made easier

# Why Furukawa Laserway?





**THANK YOU**



**FURUKAWA  
ELECTRIC**