



*On the cusp of growth*

# **OPTICAL FIBRE & CABLE INDUSTRY**

**21<sup>st</sup> April'2020**



## **Dr. Anand Agarwal** **Group CEO, STL**

Dr. Anand Agarwal is the Group CEO of STL and is passionate about driving technological advancement to impact everyday lives by innovating data networks.

Recognizing the exponential growth in data consumption and shift in the technology landscape, Anand has navigated STL from an optical communications product company to a global leader in end-to-end data network solutions.

He has been the driving force behind STL's specialized labs for photonics, glass science, network innovation and a world-class industry 4.0 manufacturing facility.

Anand is a recognized authority on 5G and network connectivity. Anand was honoured with the prestigious 'Broadband Infrastructure Leader Award' in 2016 and "Pathbreaker of the Year" in 2019 for transforming India's digital infrastructure at the Telecom Leadership Forum.

A PhD in Materials Engineering from Rensselaer Polytechnic Institute and B.Tech. from IIT Kanpur, Anand is a hands-on technologist on advanced photonics, materials science and precision manufacturing. He is a firm believer in empowering and transforming lives through technology.



Our  
business

# We design, build and manage data networks for our customers



Our  
Customers...

We serve **4 customer segments** – Telco & Infra Cos, Cloud Companies, Citizen Networks and Large Enterprises

Our  
offering...

We offer **Optical Connectivity, Network & System Integration and Virtualized Access solutions**

Our capabilities

Glass Preform

Fibre and Cable

Optical Interconnect

Globally diversified Supply Chain

Network Design

Fibre deployment

System Integration

Virtualised Network Software

# STL in numbers

**\$ 727 Mn.**

**FY19 REVENUE**

India (65%), Europe (24%), China (4%), Rest of world (7%)

**7**

**GLOBAL PRODUCTION FACILITIES**

50m fkm optical fibre capacity

**4**

**INNOVATION CENTRES**

**358**

**GLOBAL PATENTS**

**Zero**

**WASTE TO LANDFILL CERTIFIED**

## GLOBAL FOOTPRINT



**30+**

**NATIONALITIES**

3.1k Employees | Certified as Great Place to Work

# STL offerings: End to end integrated solutions

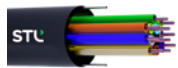


## Optical Connectivity Solutions

Optical Fibre & Optical Interconnect systems



Bend insensitive Fibre



High fibre count cable



Optical Interconnect Systems



## Network & System Integration

End to End network design and deployment



## Virtualised Access Solutions

vOLT & ONT, 4G/5G vRAN and Orchestration



v-RAN



P-FTTx

# STL Customers



Telcos

Partnering with leading global telcos for their telecom and data networks



Cloud Co.

Partnering 2 out of top 4 global cloud companies



Citizen Networks

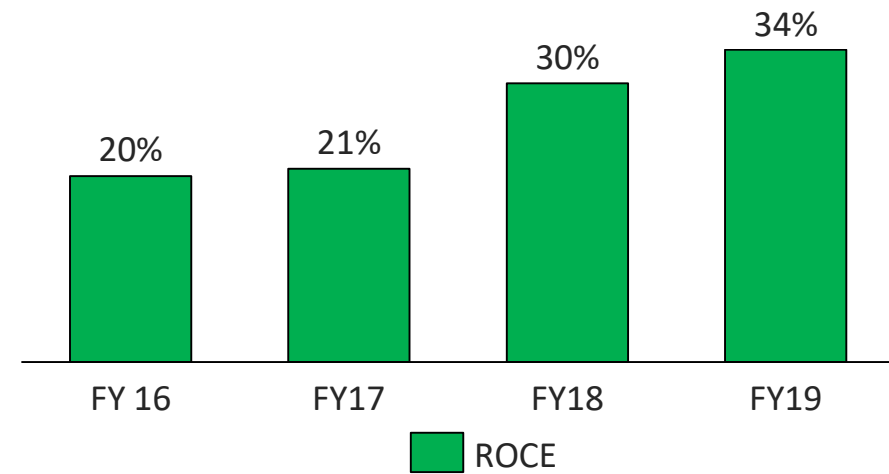
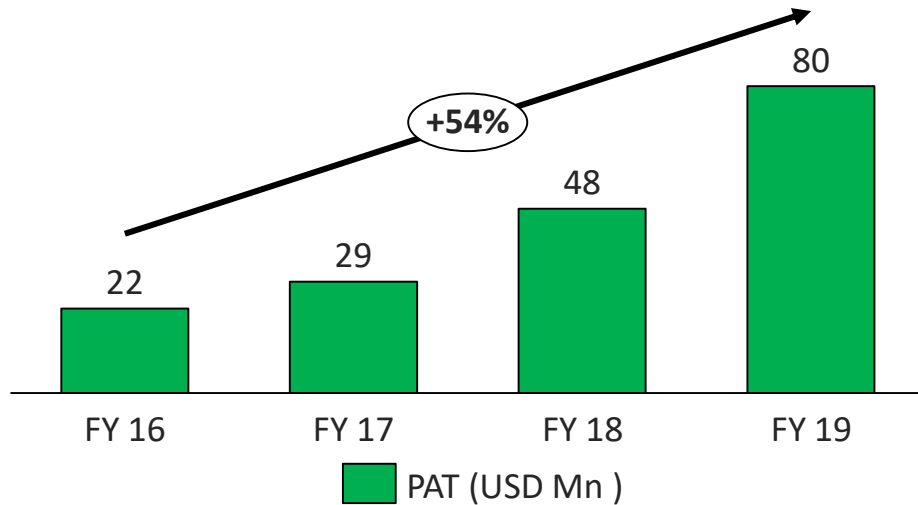
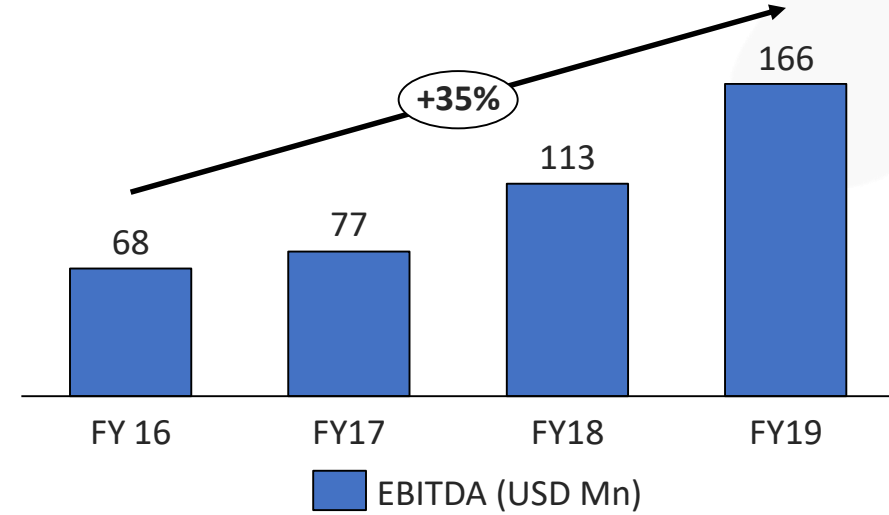
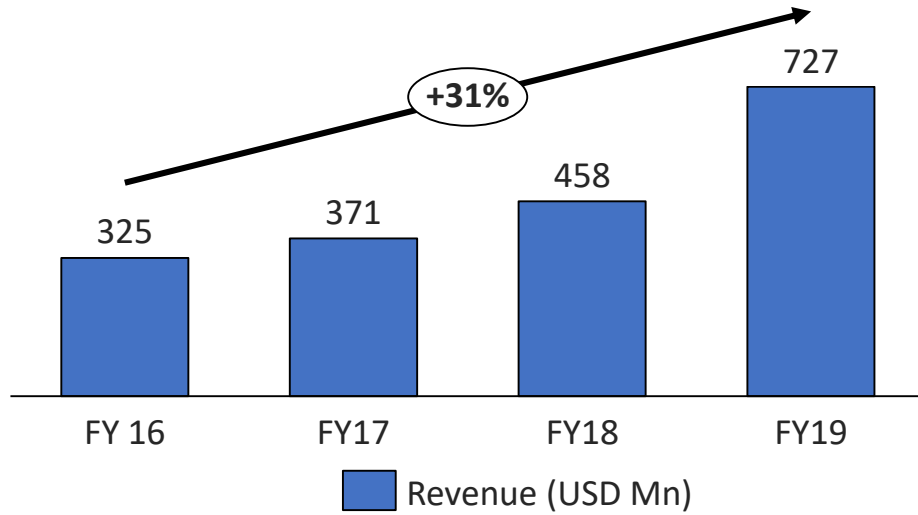
Partnering with Federal and State Governments on broadband initiatives to bring Digital Inclusion with Urban and Rural Connectivity



Large Enterprises

Helping large enterprises like defense with secure intrusion proof network and advance communication networks

# STL Financials



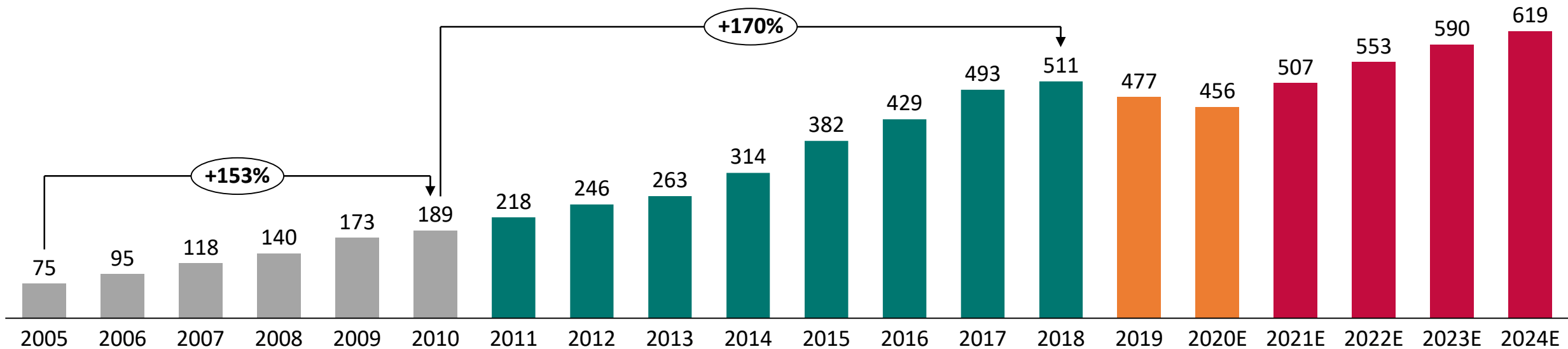
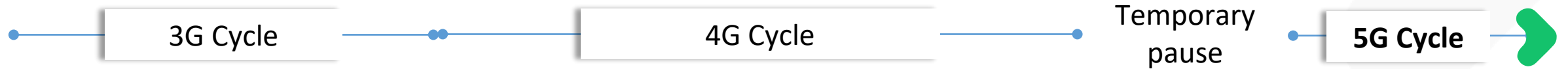


# Optical Fibre & Cable Industry





# Global optical fibre demand



Units: Mn. fkm

- The fibre demand is currently in temporary pause at the end of 4G and at the start of 5G network deployment.
- After the pause in 2019 & 2020, the fibre demand will start to grow in 2021. The 5G deployment cycle is expected to be a 8 to 10 year cycle.

# Key drivers for fibre demand

## 1 *5G investment to increase worldwide*

China IT Ministry has recently issued a directive calling on localities to accelerate 5G network buildout.

## 2 *FTTH march to continue*

Global FTTH penetration continue to increase. Developing economies like India have huge potential ahead for FTTH as penetration rates are in low single digits.

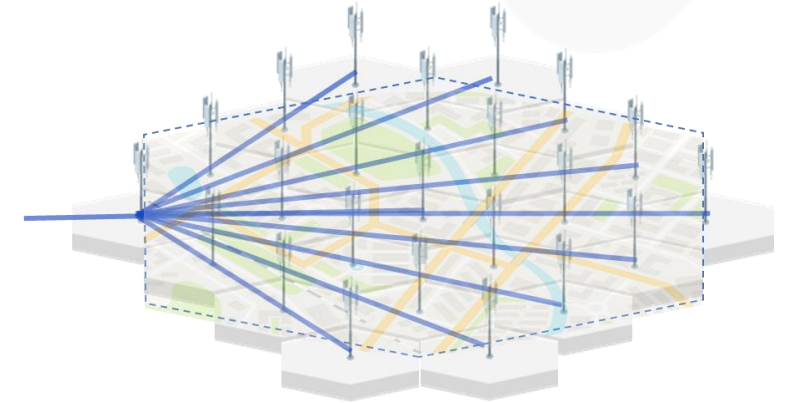
## 3 *Governments continue to invest in broadband networks*

UK Government has recently announced \$6.5 bn. investment towards delivering gigabit capable broadband network.

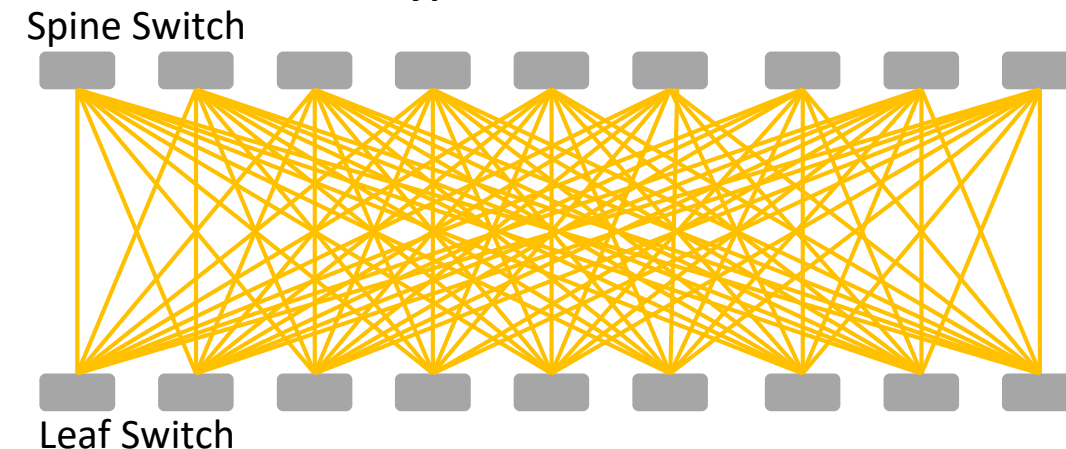
## 4 *Hyperscale datacentre companies continue to invest*

Cloud Companies teaming up with telecom operators to create edge datacentres. E.g. Microsoft has tied up with Reliance Jio & Airtel has teamed up with Google Cloud in India.

**5G Networks**



**Hyperscale Data Center**

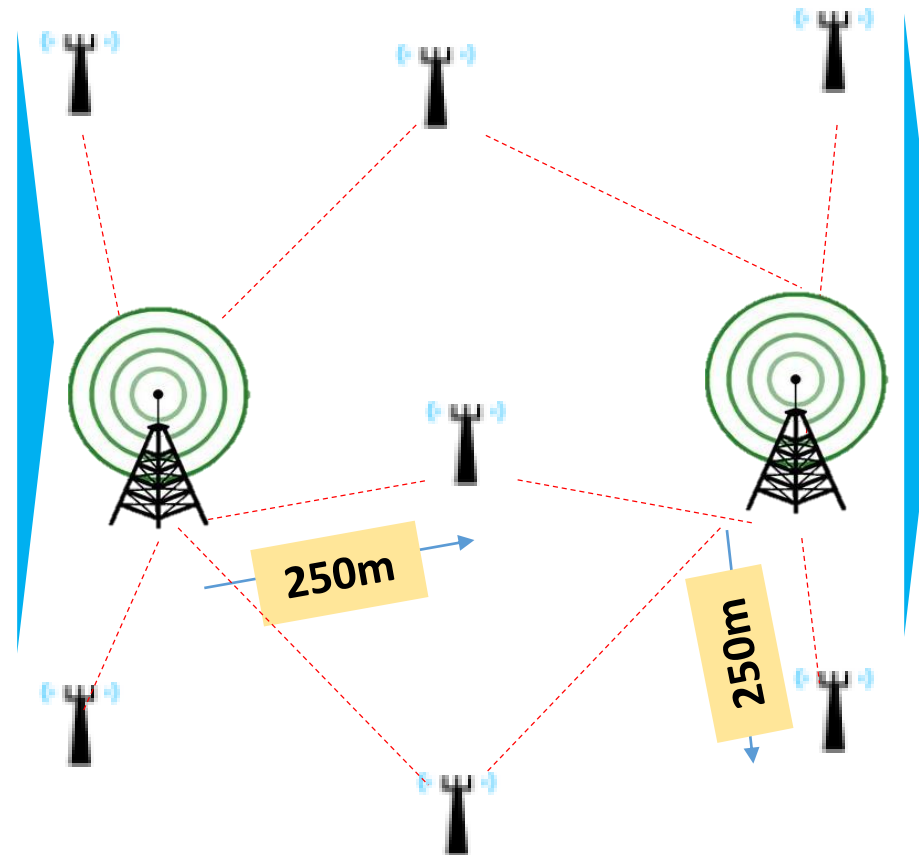
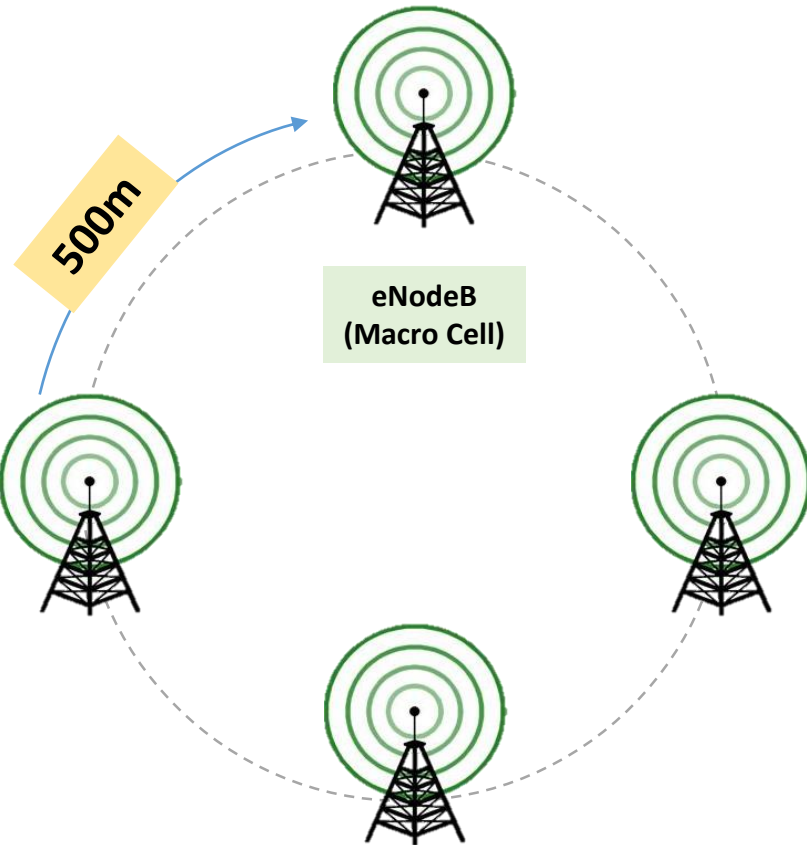


# 5G network necessitates dense and deep fiberisation

## 4G Infrastructure

## 5G Infrastructure

Illustrative 5x Small cells architecture



5G Densification	Minimum (25 Mbps per User)	Base (50 Mbps per User)
No. of Small Cells for 5G compared to 4G Macro Sites	5x	10x

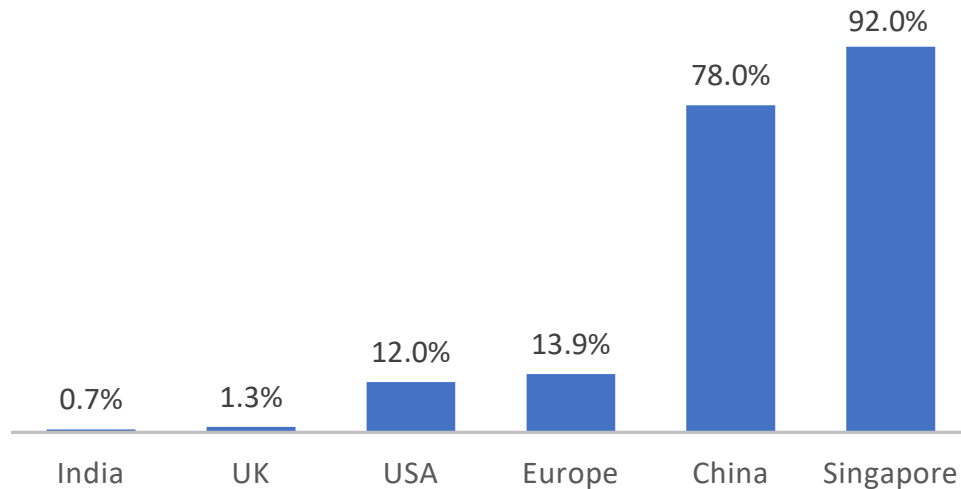
### Legend

- Macro Cell
- Micro Cell
- 4G Fibre
- 5G Fibre

# FTTH penetration shall increase drastically in a post COVID world



FTTH Penetration



- With only a few countries such as China, Singapore reaching full penetration of FTTH and reaping its benefits to its economy, the majority of the world including US, UK have a lot of potential to increase FTTH Penetration.
- Developing economies like India with very low FTTH penetration offers huge potential for growth, driving fiber demand.

*“Working from home is a necessity (to be compared to water or electricity). Government will mandate 5G and super fast fibre universal roll out”*

**- CreditSuisse**

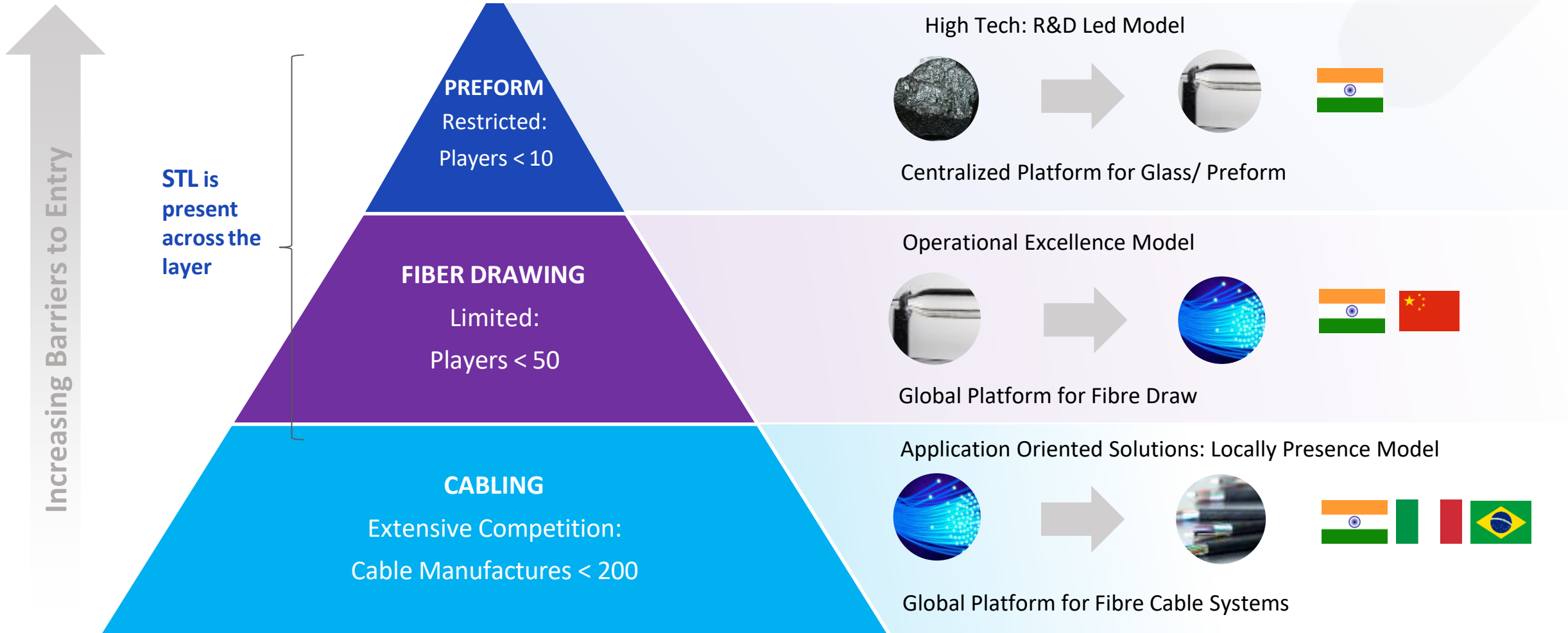
*“We believe the COVID-19 pandemic has accelerated society's transition to broadband and digitization by at least a decade”*

**- MKM Partners**

*“We think the massive and widespread dependence on broadband during the crisis will lead regulators to believe that their two highest priorities, post the crisis, will be to accelerate efforts to complete universal broadband coverage..”*

**- New Street Research**

# Fibre Industry Structure

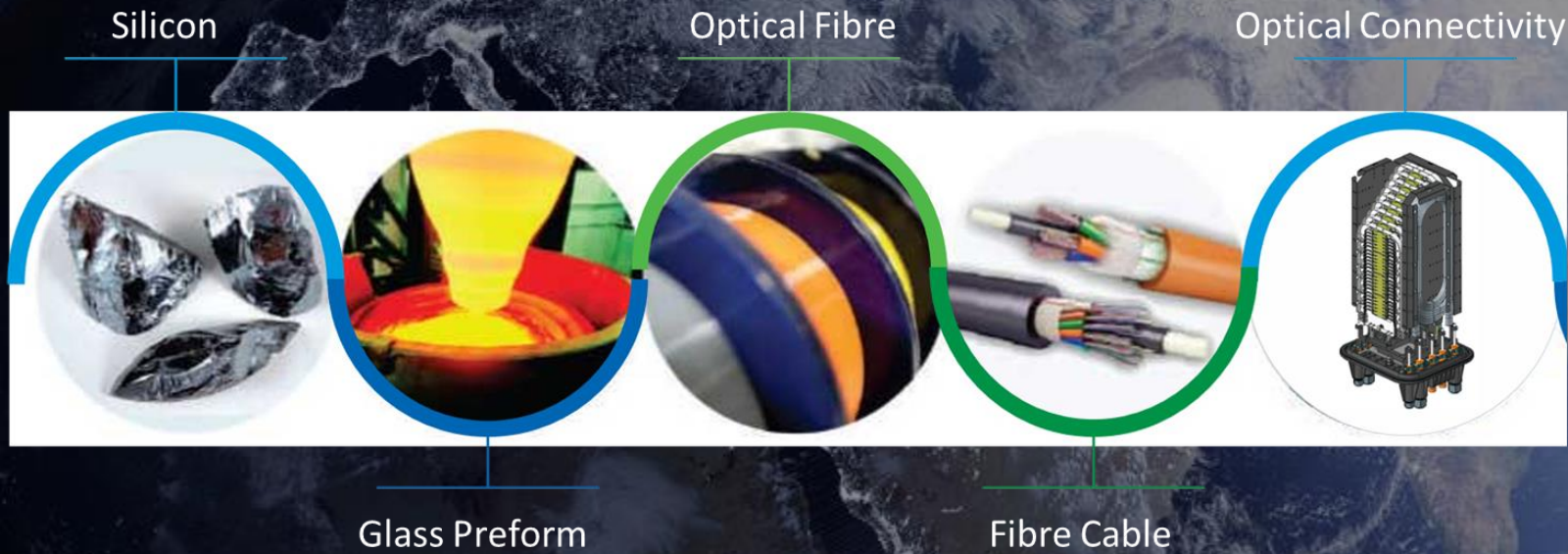


- Glass Science
- Chemical Engineering

- Fluid Mechanics
- Large scale Automation

- Wave Optics
- High Temp processing ~ 2000 deg C

# STL has integrated manufacturing from glass to cable



## OF Capacity & Plants

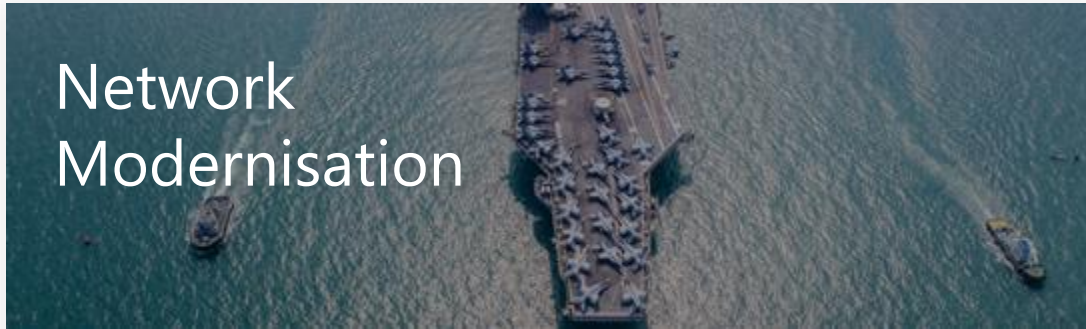
- 50 mn. fkm capacity
- 2 in India
- 1 in China

## OFC Capacity & Plants

- 18 mn. fkm capacity expanding to 33 mn. fkm
- 3 - India, Italy and Brazil

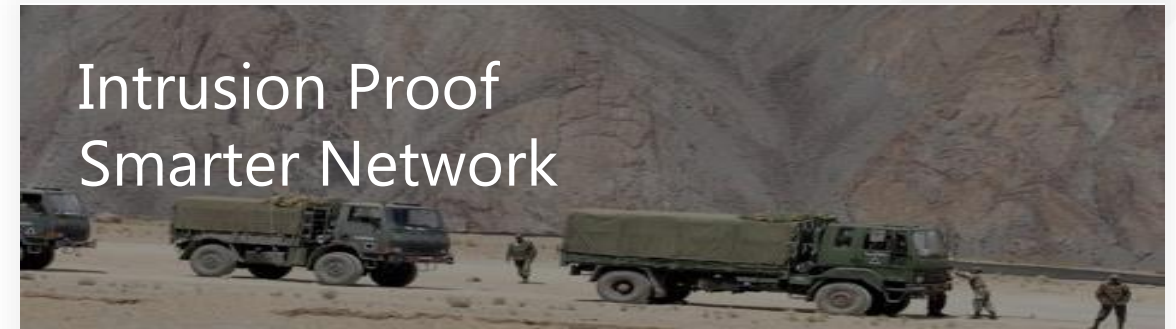


# And unique network design & deployment capabilities



## Network Modernisation

**\$500 million** multiyear project to design, execute, operate & maintain the **Indian Naval Digital Network**



## Intrusion Proof Smarter Network

**\$350 million** project for creating the world's largest **intrusion-proof smarter network infrastructure** in **Jammu and Kashmir** state of India for the **Indian Army**



## Futuristic SDN ready state wide network

Providing ubiquitous access of **high speed broadband** in **4.5 million homes** in the state of **Telangana** using FTTx Mantra and iCORE solution



## A transformative digital inclusion project

**Connecting 7.5 million people** and 4,045 villages in the state of **Maharashtra** using unique STL LEAD 360 approach



## Security through the power of IoT

Impacting positively **325K lives** with smart IoT driven infrastructure in **Kakinada Smart City** in the state of **Andhra Pradesh**

# With integrated technological capabilities from core fibre research to wireless network orchestration



4

Innovation Centers



Optic Fiber Center of Excellence, Aurangabad



Cable Design Lab, Silvassa



Center for Smarter Networks, Gurgaon



STL Cloud Lab, Ahmedabad

358

Global Patents

Industry & Academia

Partners in Innovation

MIT,USA; RUTGERS,USA; IIT, Madras

- Research on innovation Multi-Stage fibre manufacturing process
  - Next-Gen fibre to improve network performance
  - Research and accelerate the advancements in 5G

IIT, Madras

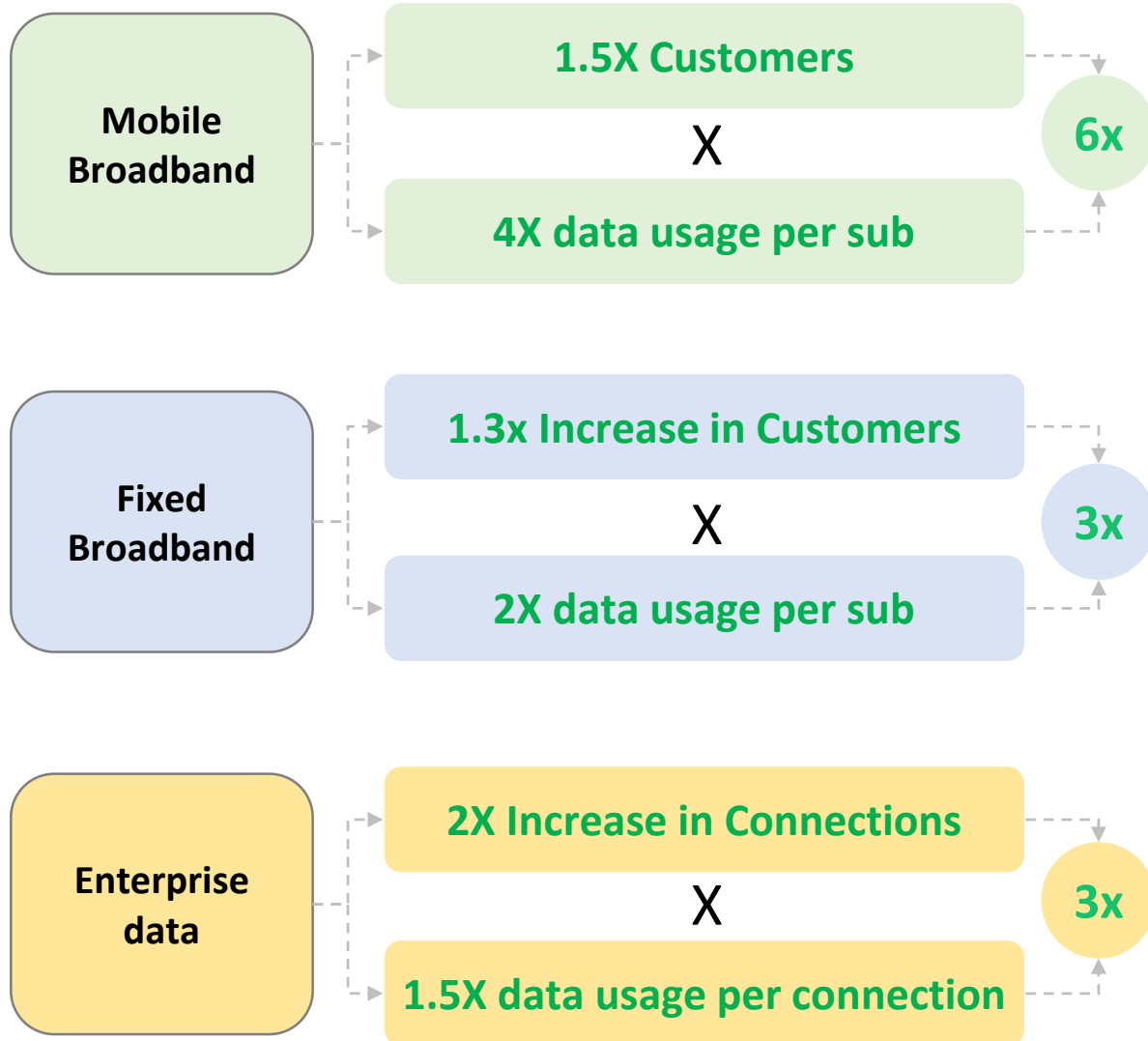




# The Future is Exciting

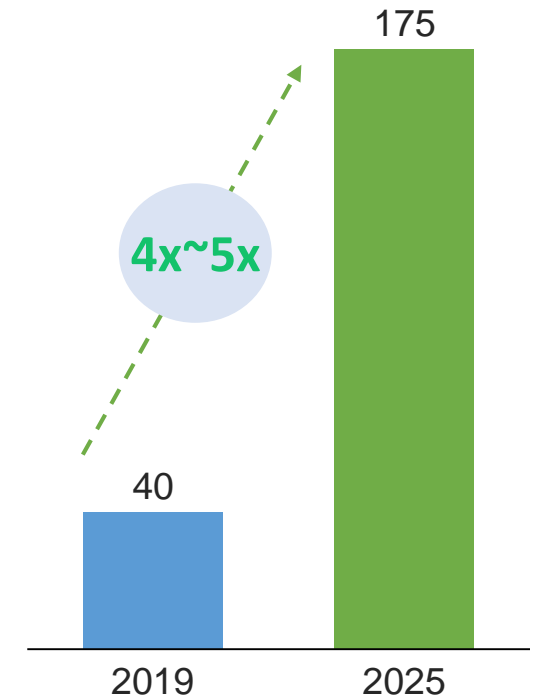


# Data growth is continuing unabated



Data Traffic growth: **4X-5X**

### Global Data Traffic in ZB



# Leading to creation of newer generation of networks which is unlike any past network



## 4G Data Network

Less end points & wireless last mile connectivity

Hardware and software packed together

Hardware dominated and closed source

Telco Use cases only

## 5G Data Network

Dense & deep fibre networks *with multiple end points & low latency*

Disaggregation of hardware and software

Virtualised & open source software

Emergence of enterprise segment with a lot of use cases e.g. (*Industry 4.0, Intelligent mobility, Smart grid, Smart farming, E-health, etc.*)

# STL is uniquely positioned to take advantage of the opportunity

## 5G Data Network

Dense & deep fibre networks *with multiple end points & low latency - new age fibre along with deployment*

Disaggregation of hardware and software - *commodity hardware*

Virtualised & open source software – *Disruption by new players outside of big 4 vendors*

Emergence of enterprise segment with lot of use cases e.g. (*Industry 4.0, Intelligent Mobility, Smart Grid, Smart Farming, E-health, etc.*) with simple Product Requirement- *Solved by new Players outside of big 4 vendors*

## STL end to end Solutions



Optical Connectivity Solutions



Network & System Integration



Virtualized Access Solutions



FTTx  
**mantra**  
One Solution. Countless Opportunities

Mobile  
**EDGE**  
Solution

**vRAN**

STL has partnered with ASOCS, which specializes in vRAN Solutions, STL acquired IDS, which specializes in datacenter network infrastructure design & deployment

*From enterprise (private cloud) to global internet, new network capacity will be added*

***To become the default partner to our customers for all their data & IT networking requirements***

***With our unique integrated end to end solutions***



Telcos



Cloud



Enterprises



Citizen Networks



***Global leadership in optical connectivity***



***India leadership in network & System Integration***



***Disrupter in virtualised access solutions***

# Summary



The optical fibre demand shall continue to grow on the back of investments in 5G, FTTH & datacentres. COVID-19 shall further accelerate these investments.

The industry structure favours integrated global players who shall capture disproportionate value in the total supply chain.

The networks of the future (5G) shall be fibre rich, open, software defined & virtualised.

STL with its capability in optical connectivity, network & system integration & virtualised access solutions is uniquely positioned to take advantage of this mega opportunity of future network creation.

Thanks