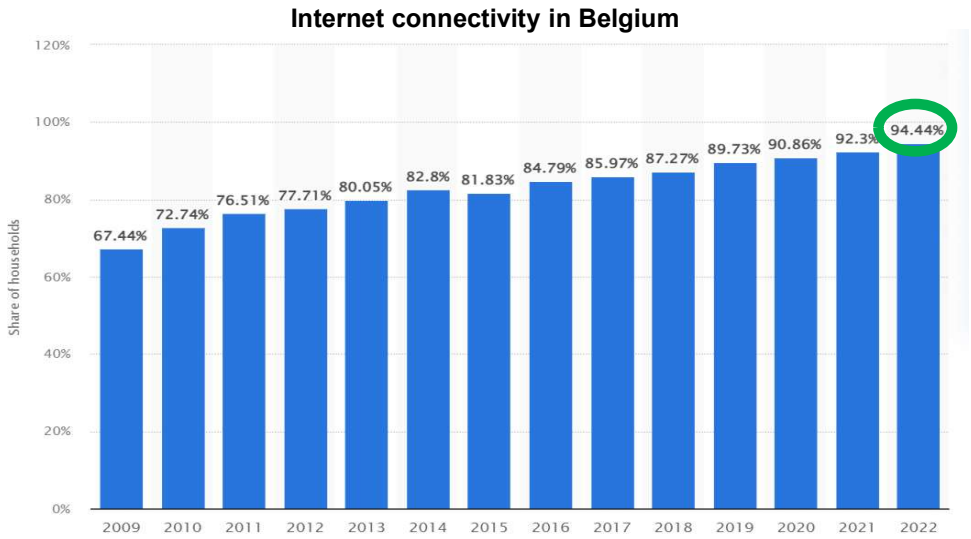
Towards
Fiber Densification

Sam Leeman
PLM Head, Optical Connectivity
STL - Sterlite Technologies Limited

Piet den Ouden
Key Account Director
ALCADON

State of broadband connectivity in Belgium

Good News



Not So Good News

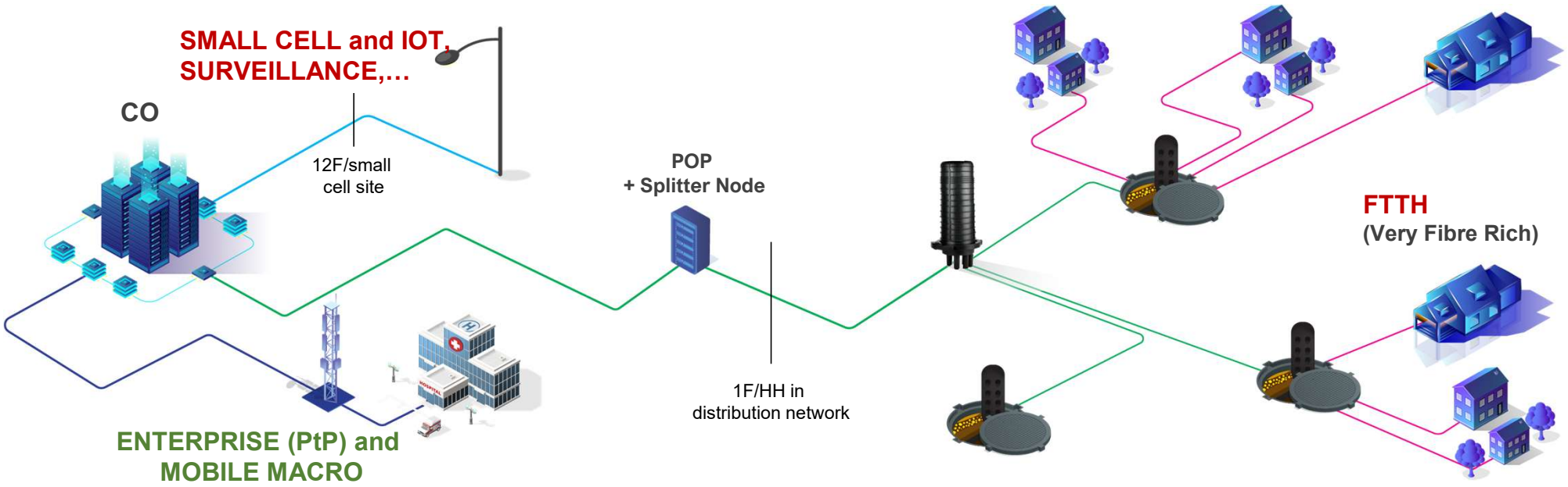
- only 6.5% of households have access to fibre optic networks in Belgium
- Compared to the EU average of 42.5% of households having access to fibre internet, **Belgium lags far behind**

Industry is focusing on fibre densification to achieve 100% fast broadband

- By 2028, Belgium telecom operators is aiming for **4.2 million fibre optic connections** in Belgium (~70% of all households)
- Belgian telecom operators **invested a record-breaking €1.022 billion** in their fixed networks last year
- Belgium Govt. is driving a **national plan for fixed and mobile broadband** to provide fast internet access across the country by 2024

Source – Statista and Brussel times

Fibre Densification In Distribution Network Belgium



LARGELY BUILD (DONE) | MOSTLY TO BE BUILD (TO BE DONE)

30%

Fibres required for P2P Distribution

35%

Fibres required for Small Cells

35%

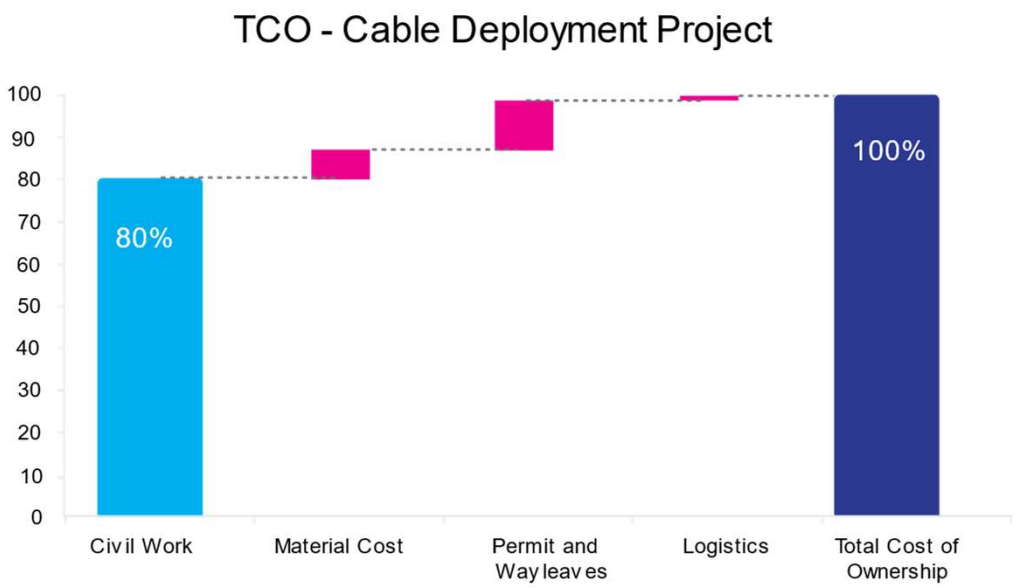
Fibres required for FTTH Distribution (PtP alike)

Sweat your assets

80%

Cost share of civil works in a cable deployment project

Rest 20% constitutes cables, ducts and supplementary products



A large amount of fiber has to be built with minimizing civils and maximizing re-utilization of existing infrastructure

- Ducts
- Free capacity in exiting cable routes
- Human Resources

End to End solutions drive optimised rollouts

MICRO MODULE CABLE WITH COMPACT CLOSURES

- **Most fiber dense solution per duct cross section and space saving in congested manholes**
- **Fibre splicing is labor intense (Single Fiber)**
- **Bend resiliant fiber (A2 or A2 with A1 fibre MFD)**

ROLLABLE RIBBON CABLE (IBR) WITH COMPATIBLE CLOSURES

- **Fastest splicing solution (reduced labor) and optimizes high fiber count routes**
- **4x less splicing time compared to single fibre**
- **Bend resiliant fiber (A2 or A2 with A1 fibre MFD)**

DUCT 14/10mm

LT Cable

72F 8.0mm

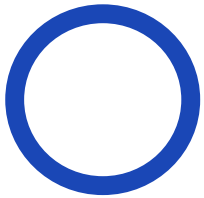
MICRO 200µ Cable

288F 7.4mm

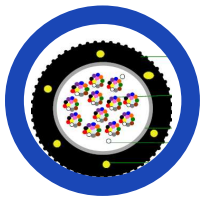
MICRO 180µ Cable

288F 6.8mm

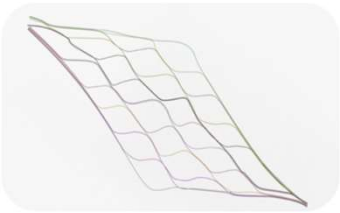
?



IBR Cable

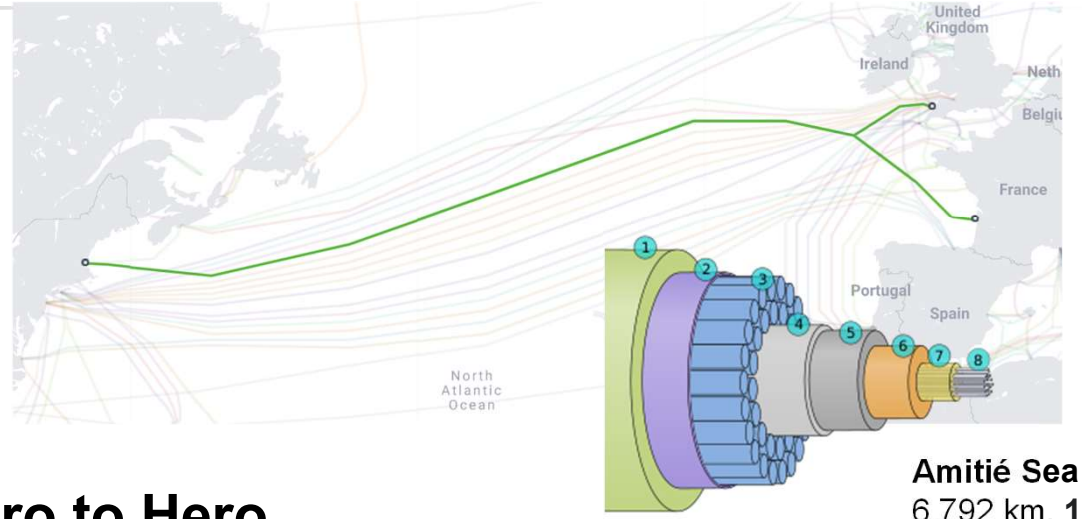


144F 8.3mm



WDM and Next-Gen PON; holy grail?

Very High Density Cable: DC Interconnect up to 6912 Fibre's for a few kilometers



Amitié Sea Cable, 2023, 6,792 km, **16 fibre pairs** *each with* **23Tbit/s** capacity

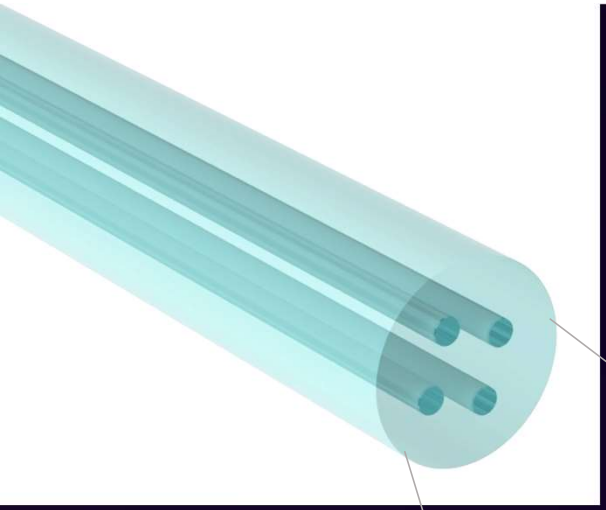
WDM: from Zero to Hero

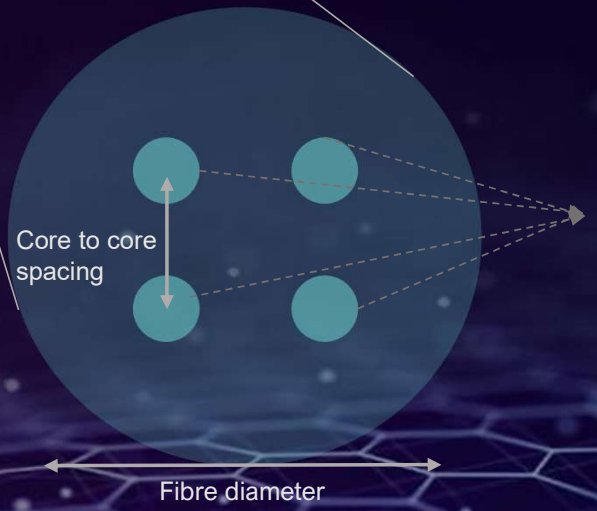
But depends on distance, application, cost and Fiber Availability

PON: Sharing is Caring

Best combine **PtMP** over physical **PtP**: most **future proof** and **technology independent**
Where to place **splitters** in the access network for **easy future changes and or by-passes**
Still will potentially not serve all applications like next gen Mobile; FttO, IoT, etc

Multicore fibre – A future enabler for further densification?



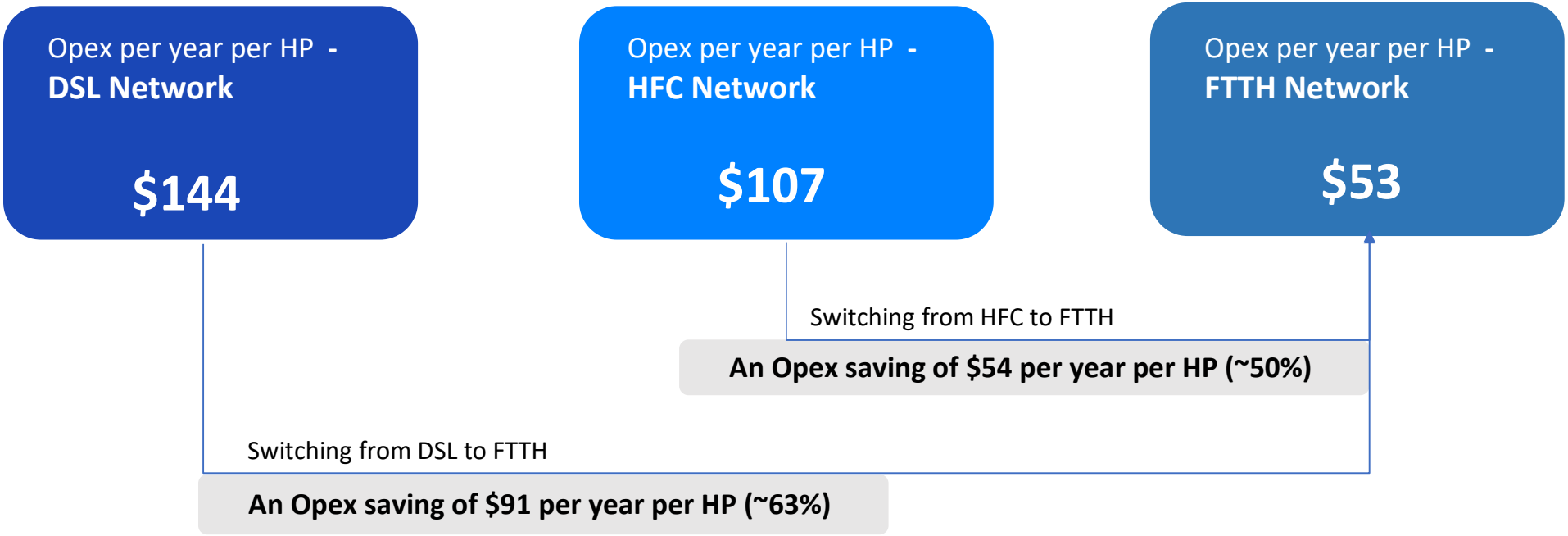


- A fibre with 4 cores inside it in the same dimensions
- Leverages Space Division Multiplexing (SDM) to gain 4X transmission capacity per fibre
- High capacity per cell site in 5G networks
- Quadrapule data center connectivity
- Faster splicing and cable deployment
- Compact form factor with improved material efficiency leading to lower TCO

OPEX: an angel or a demon?

An FBA Study reveals that

Reference – Broadband communities (BBCMAG)



Average FTTH cost per HP **1200€**

Copper to FTTH full switch **Drops Opex by 50-90€ per HP**

Only OPEX saving creates payback in 13-24 years Vis-à-vis HFC/DSL network

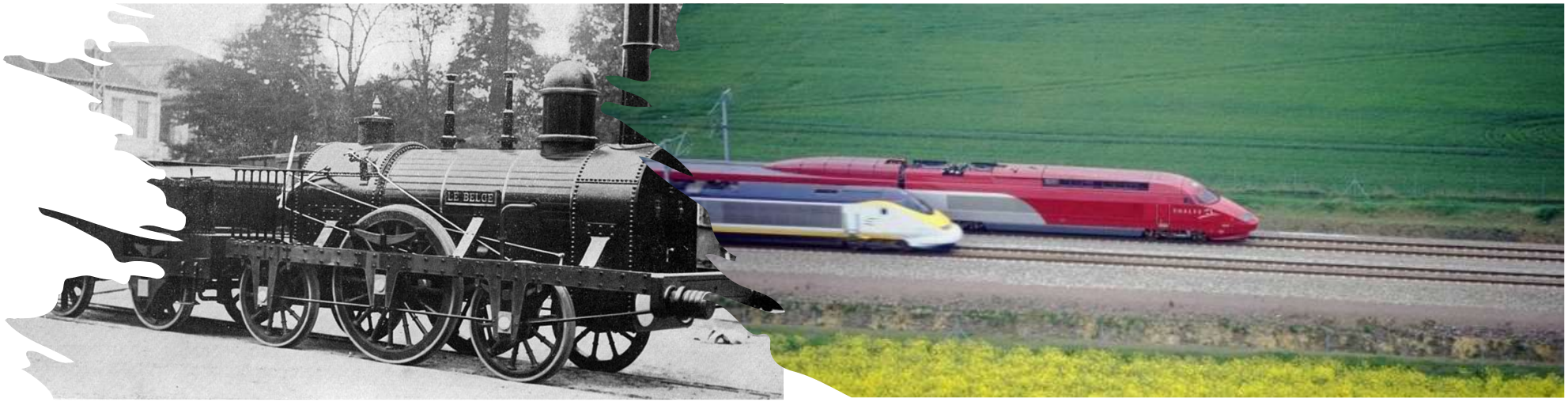
* Not considering the additional revenue streams and capex savings due to technology enhancement

Building FTTH to reduce opex is a commitment

Unfortunately we see in Europe quite some CAPEX optimized networks without considering OPEX later

- Field labour versus factory labour
- FTTH network architecture and transmission technology
- Future proof and high-quality components/materials: 7% of the material selection contribute to 30% of the OPEX costs later

Conclusions



- Focus on Flexible Fiber infrastructure to support evolving needs
- More endpoints are needed on short term; networks should be flexible to support
- More fiber in at Backbone/Metro and Access is only a matter of time
- Multiple solutions available encounter expected broadband growth