

Benefits of optical fibres standardization

FTTH Access networks and cooperation needs

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1) Benefits of optical fibres standardization

Take away

Interoperability, Vendor independence, Stability, Price are valuable benefits of standardization

***Motto: „If you cannot measure it, you cannot improve it“
(Lord Kelvin, IEC first president, 1906)***

Needs

- New Services (high-speed data, VoIP, high definition TV, etc.)
- Better network stability
- Increasing data interchange

Approach

- Standards are part of each product or service:
 - E2E solutions (FTTH, core network, etc.)
 - Development of new components (optical frames, cables, connectors, devices, etc.)
 - Implementing of new technologies (WDM, LTE, etc.)

Benefits

- Products, services, solutions available on the free market → Price advantage
- Interoperability (custom & network side), Vendor independence, Easy deployment
- Own knowhow anytime available, good reaction time on customer needs

Competition

- Non-standardized solutions and products shall be avoided

Standards reduce uncertainty and minimize the cost impact

A continuous standardization work is a must

- Continuous standardization work leads to minimizing the uncertainty:
 - easy RFI/RFQ
 - same ,language' with customers, suppliers
 - high level Knowhow internally
 - easy development of procedures
 - excellent reaction time, in benefit of customers

- The ,always on' standardization work generates low costs:
 - Standards costs are low
 - no special activities needed
- ,act reactively' will generate high costs:
 - Standards, Knowhow have to be updated
 - low reaction time → no customer satisfaction
 - high uncertainty

- Cost impact if ,not follow' or ,reactively' is high
 - no own Knowhow
 - dependence of suppliers
 - loss of business because uncertainty
 - no full control of own products

		Uncertainty	Costs (standardization)	Cost Impact
✓	Standardization work 'always on'	○	◐	◐
✗	do not follow	●	○	●
✗	later/ by request/ act reactively	◑	◑	◑
	● = high ○ = low			

Overview national and international standardization bodies – a Swiss view

Category	Standards		
	General	Product oriented	Application oriented
International	ISO	IEC	ITU-T
Europa	CEN	CENELEC	ETSI
Switzerland	SNV	SEV, TK86	ASUT
USA	ANSI	IEEE	TIA/ EIA

Legend:

- ANSI = American National Standards Institute
- ASUT= Association Suisse des Telecommunications
- CEN = European Committee for Standardization
- CENELEC = European Committee for Electrotechnical Standardization
- EIA = Electronic Industries Alliance
- ETSI = European Telecommunications Standards Institute
- IEC = International Electrotechnical Commission
- IEEE = Institute of Electrical and Electronics Engineers
- ISO = International Organization for Standardization
- ITU-T = International Telecommunication Union- Telecommunication Sector
- SEV = Schweizerische Eisenbahn und Verkehrspersonal- Verband
- SNV = Schweizerische Normen Vereinigung
- TIA = Telecommunications Industry Association
- TK86= Technische Komitee CH passive optische Komponenten

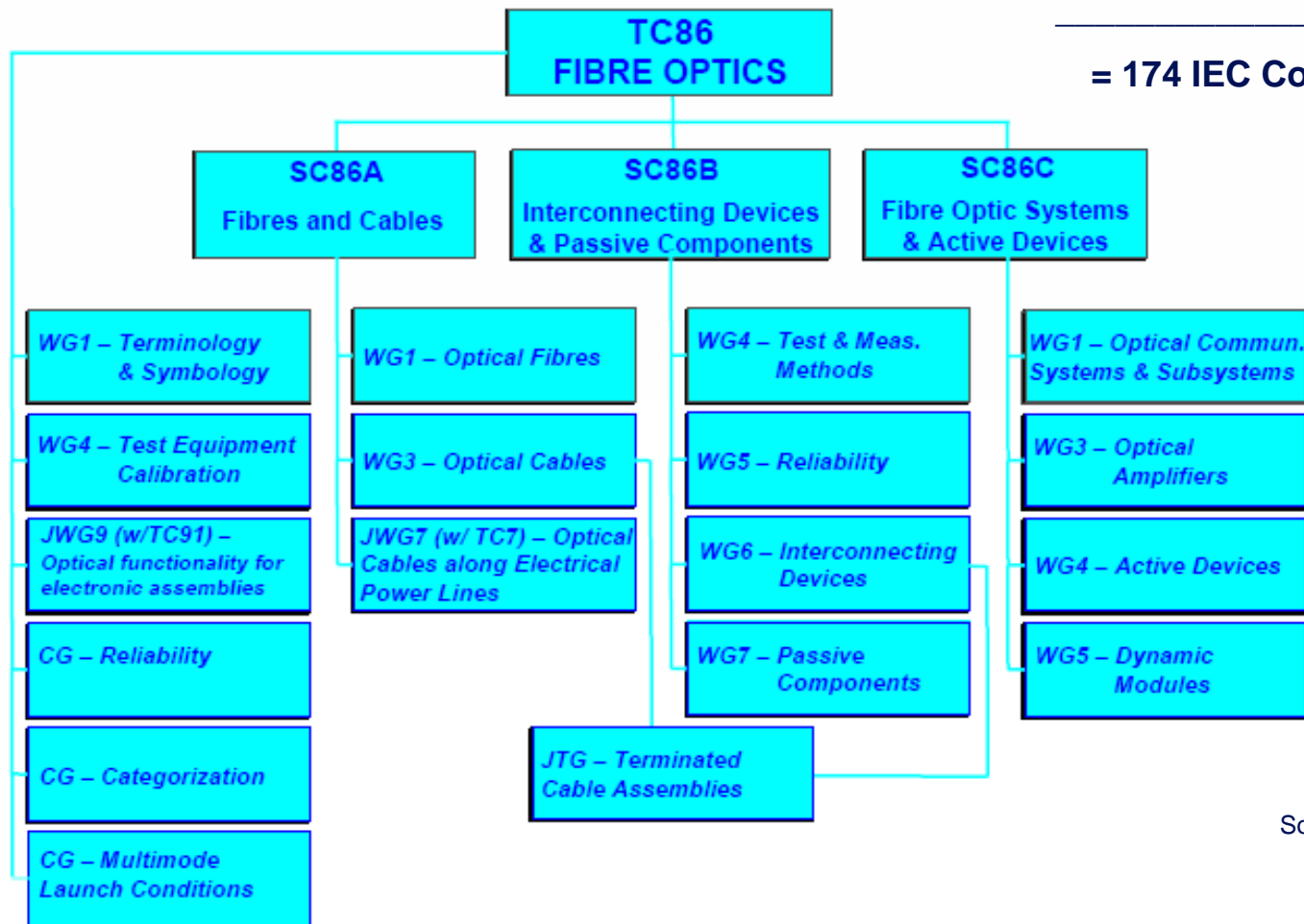
Example: IEC TC86 committee structure

TC86 Family

94 TCs (Technical Committees)

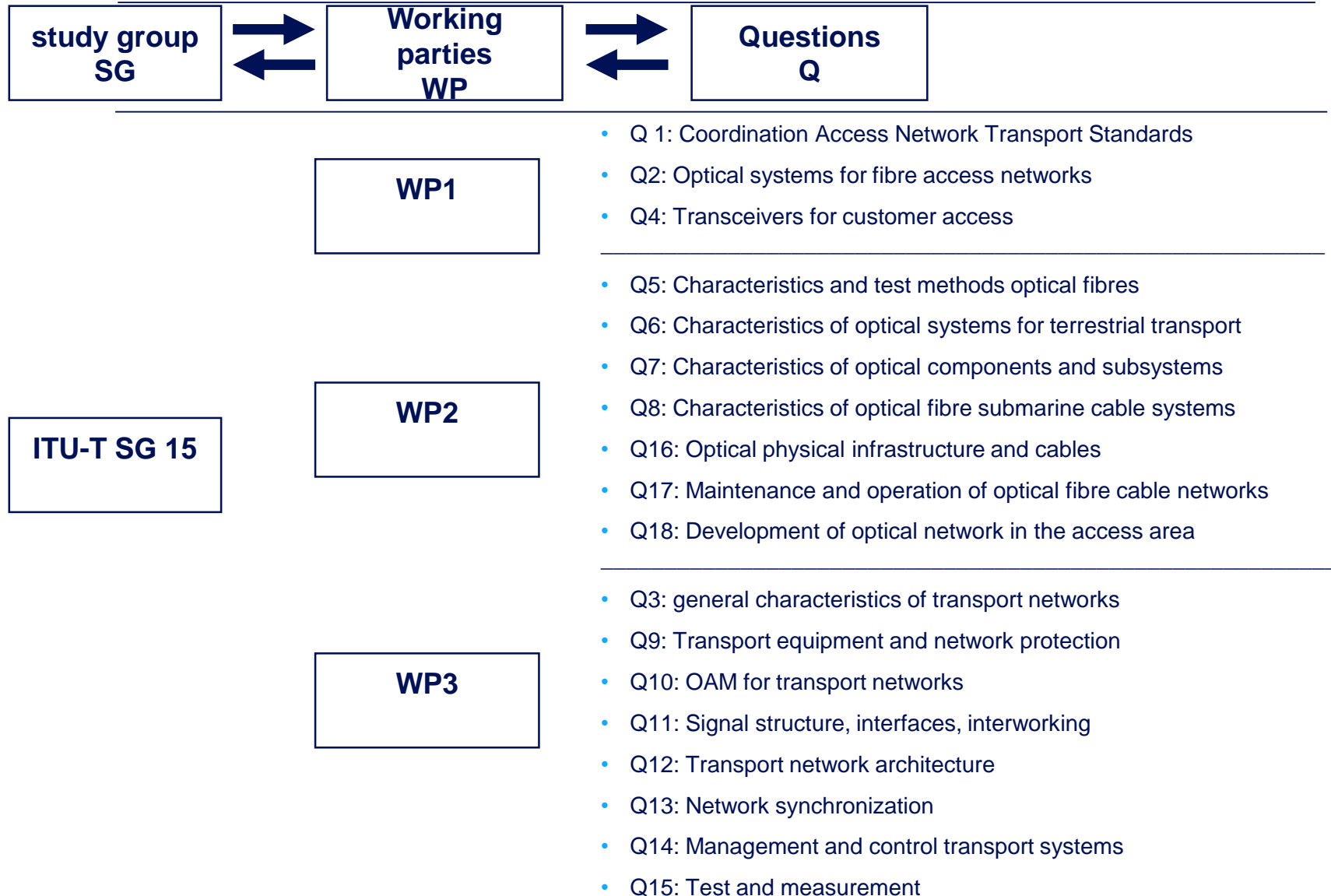
80 SCs (Subcommittees)

= 174 IEC Committees



Source: IEC website

Example ITU-T Study Group 15 standardization structure



Short update after the ITU-T SG15 meeting in Geneva, 15-26 Feb2016

- Fibre standardization discuss the introduction of ITU-T G.652E fibre category:
 - Technological reasons: ITU-T G.657A1 → ITU-T G.652E
 - Simplification of low-bend categories: only ITU-T G.657A2 (trench-based).
Discussions regarding a new category ITU-T G.657A3 still ongoing

2) FTTH Access networks and cooperation needs

One FTTH approach

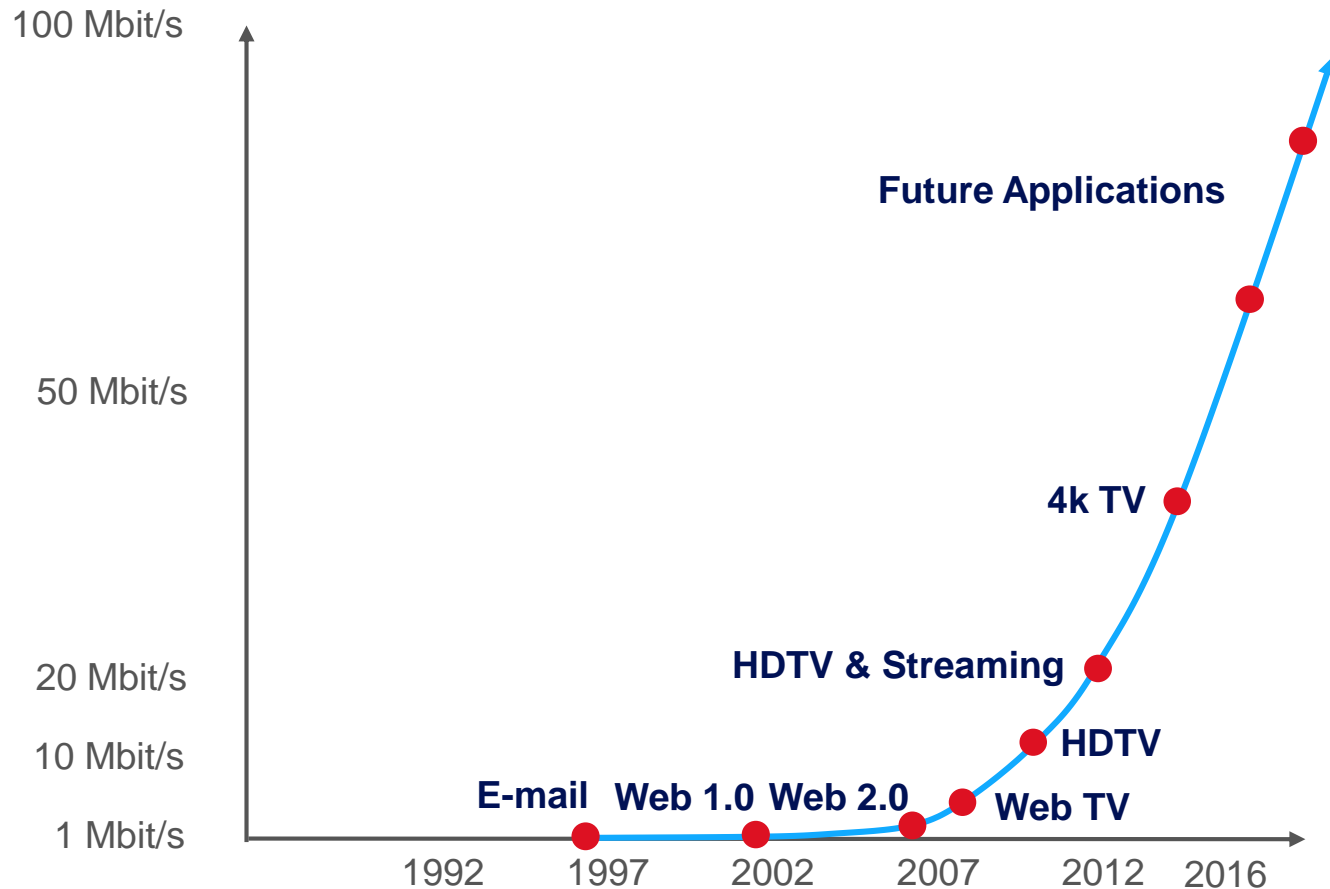
Rapid development

Bandwidth requirements are constantly increasing

- Telecom networks are becoming **the nerve systems of the information society**
- Traffic volume in the fixed network doubles **every 19 months** and **every seven months** in the mobile network
- New applications stimulate **demand for higher bandwidth**
- **Multi-device:** An increasing number of devices access a single connection

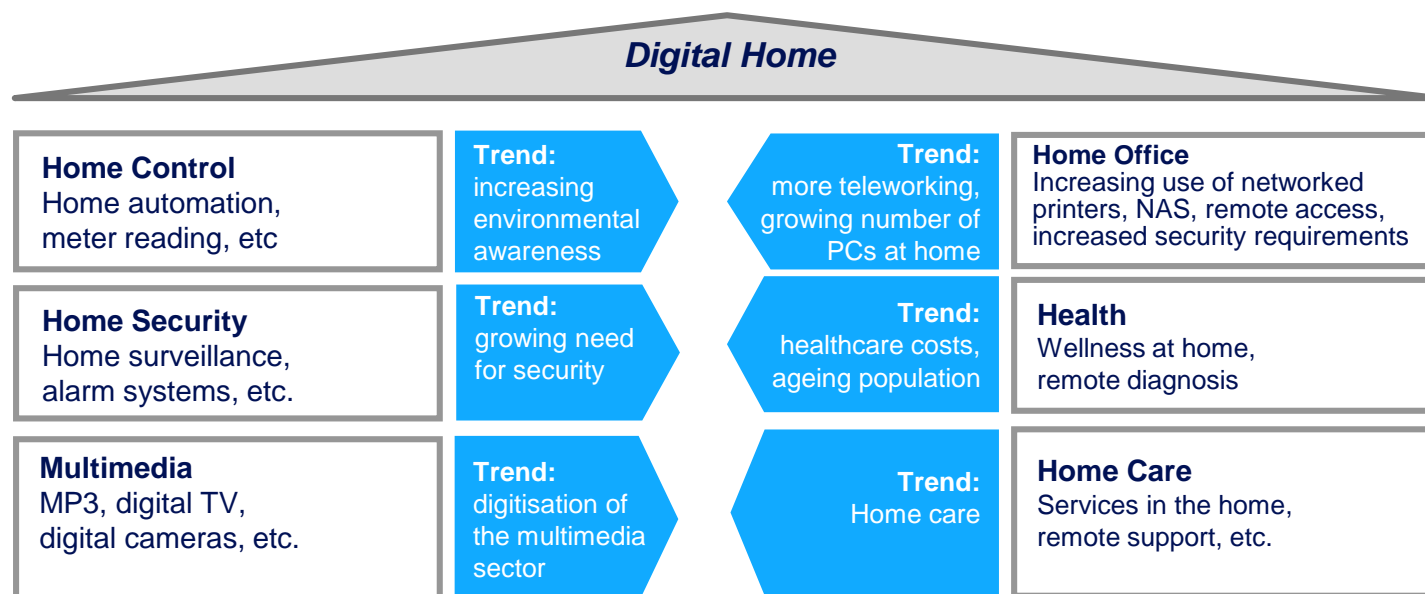
Customer needs

Increasing bandwidth enables new services to be developed



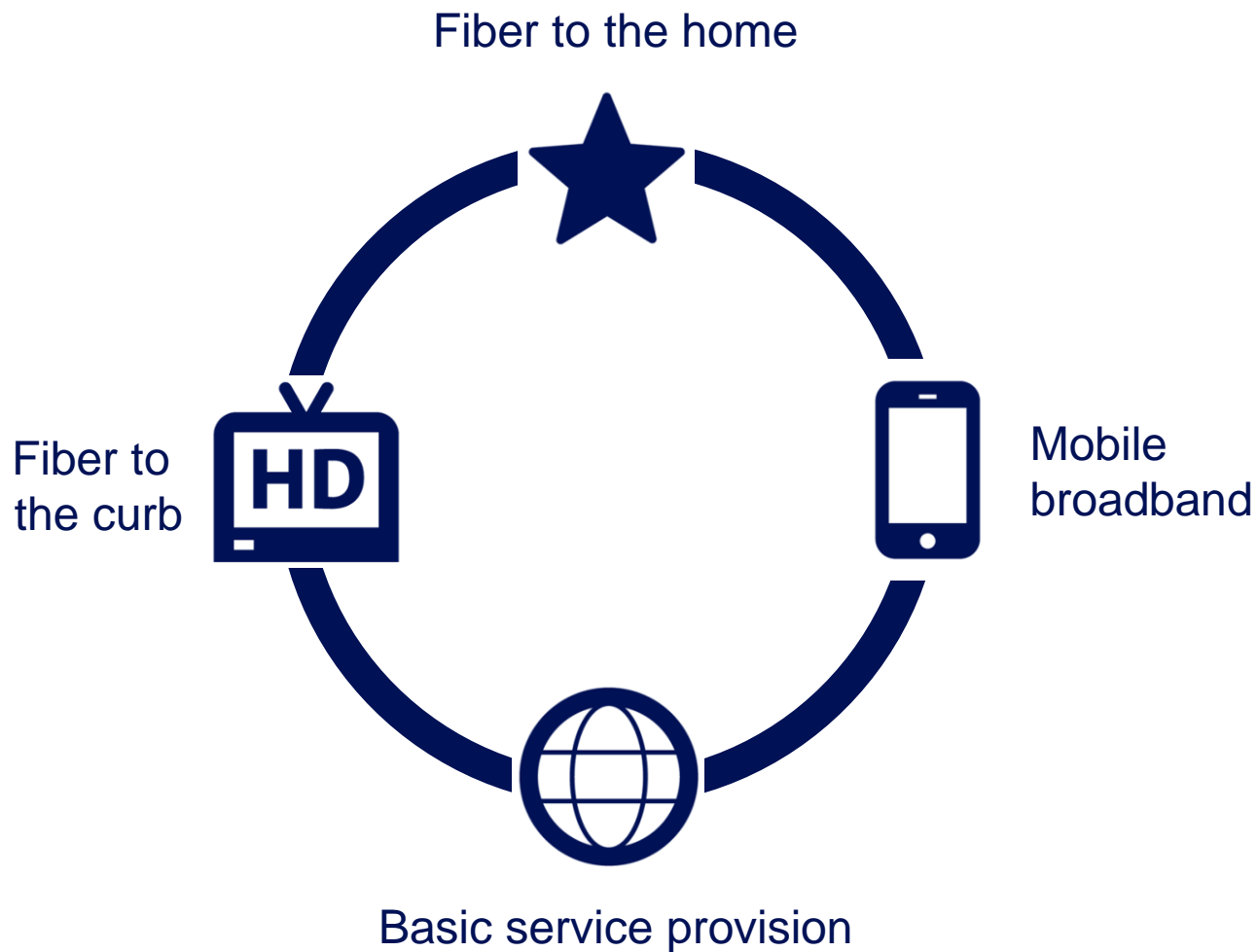
Reasons to build FTTH Networks

Tomorrow's Services as a mix of services



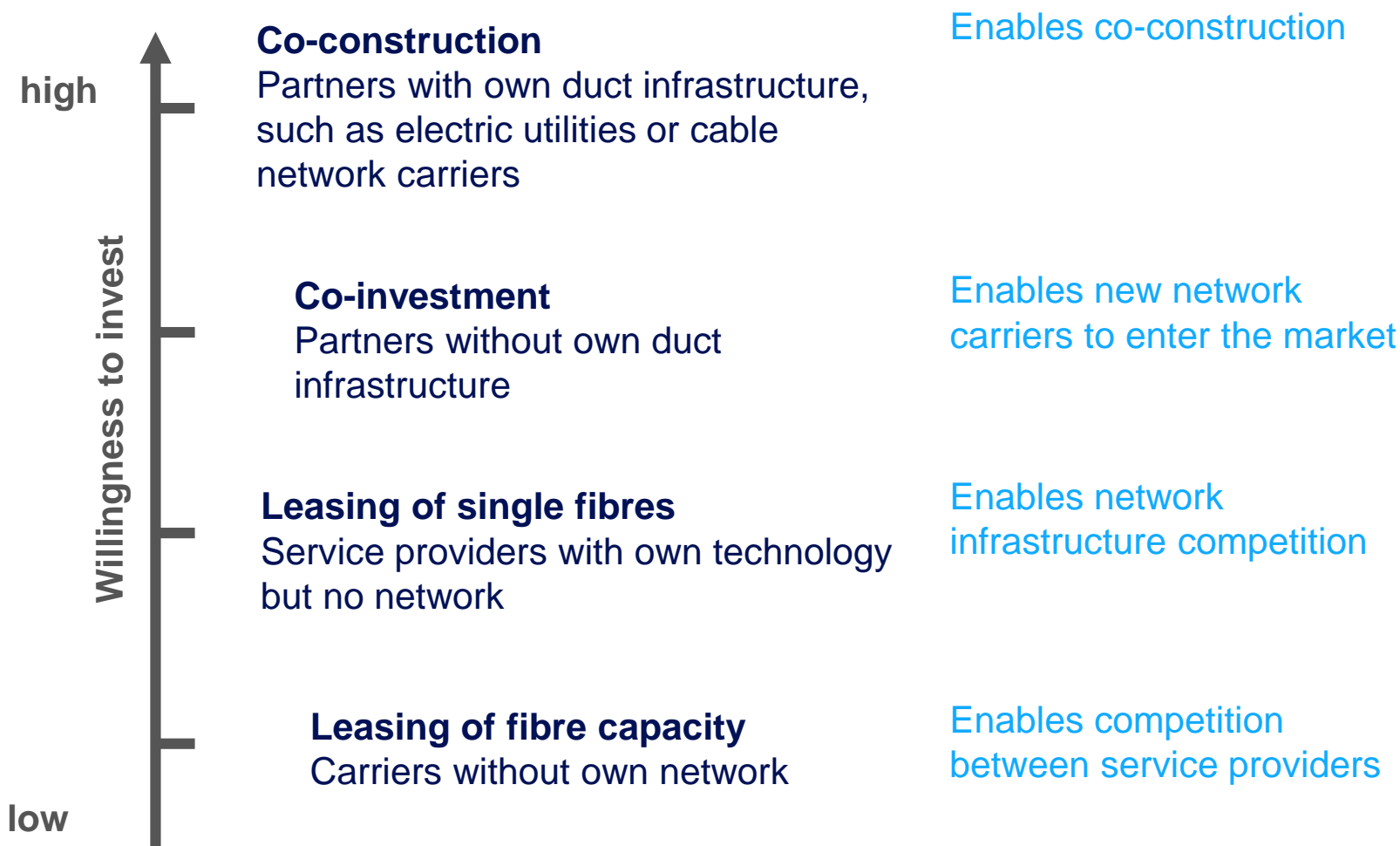
Broadband

Meeting the needs at all times with a mix of technologies



Operators are focusing on Co-operation

Cooperation Models



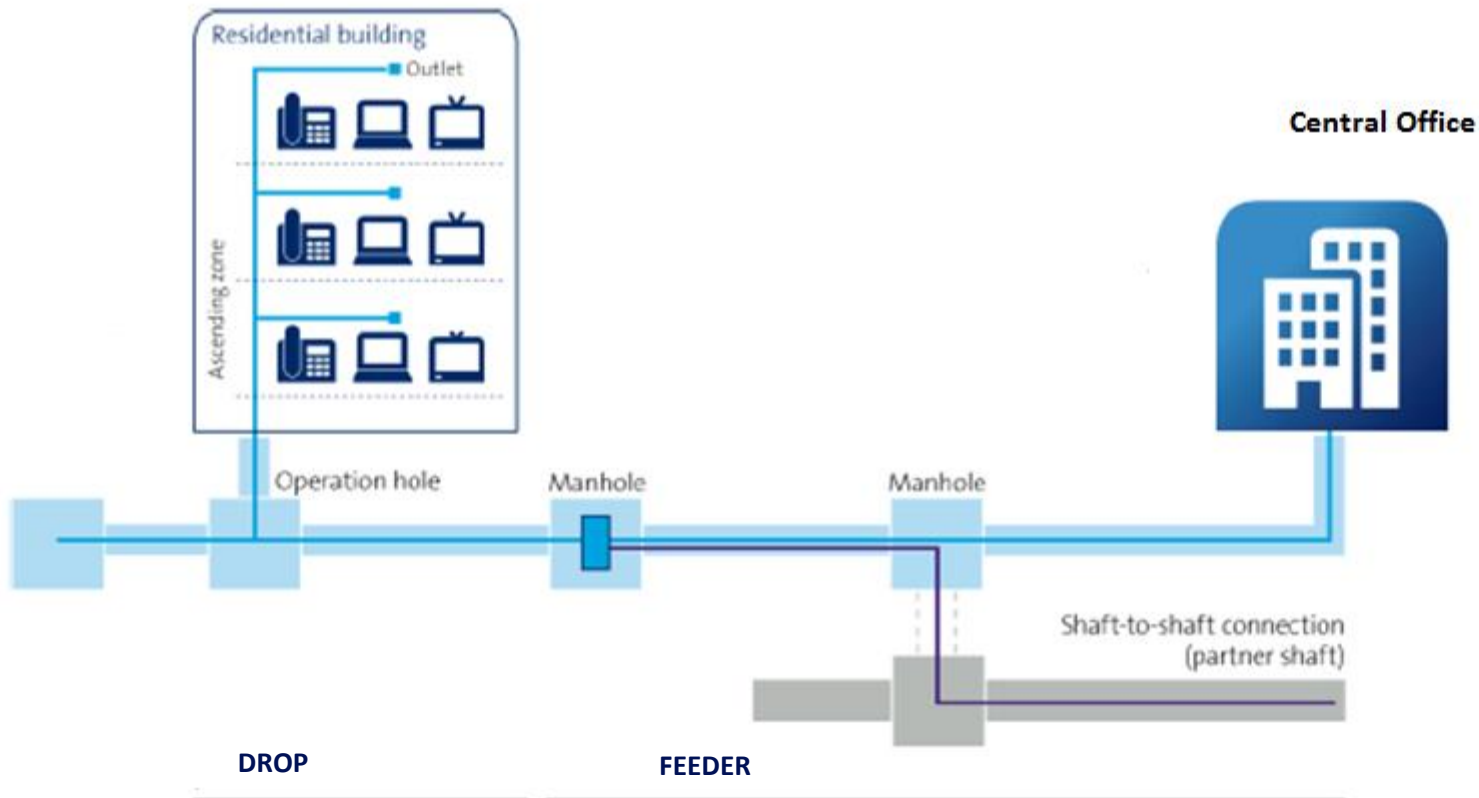
Fibre to the Home

One example of cooperation model (F, CH, etc.)

- Up to **four partners** can work together, thereby splitting the **investment risk**
- **Several fibres** are laid to the optical socket at the customer end
- Telecommunications providers who do not wish to invest gain **access to all network levels**
- Players have agreed on **common standards**
- These basic principles have been agreed among the market players after several **“round tables”** organized by the local regulators

Cooperation between Service Providers and Municipalities boosts the rollout

Point-to-Point FTTH



Fiber To The Home

Cooperation projects are an opportunity for each country

- **Infrastructure competition** is intensified by FTTH
- **Parallel networks are avoided** thanks to construction partnerships
- **Collaboration** allows faster and more cost-effective connection
- **Multi-fibre model** allows open access for telecommunications service providers
- End customers are therefore **free to choose** the telecom provider

Success factors

These points are essential for cooperation projects to succeed

Uniform standards

- Simplification for operators and customers

Fair and balanced partnership

- Best practice and long-term mutual dependencies

Investment security

- No regulation and intervention at the present time which would endanger investments in next generation network

Examples of FTTH Standards

National and International FTTH Standards are available

ITU-T L.90:

- Describes both P2P and PON technologies
- Defines the FTTH P2P and PON terminology
- Contains example of FTTH implementation from different countries
- Available on the ITU-T website



Adobe Acrobat
Document

Swiss Ofcom FTTH standard:

- Defines the drop and home cabling to the customer wallsocket
- Defines the FTTH P2P terminology
- Full compliant to ITU-T L.90 and other international standards
- Free available on the Swiss Ofcom website



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Document

It is highly recommended to contact an experienced consultant to correctly address FTTH projects

Conclusions

- Standardization allows the service providers
 - To define quality concepts that are easy measurable and reproducible
 - To have a common language to suppliers, technology integrators, partners
 - To buy optical components on the international market
 - To implement scalable technologies
- FTTH examples demonstrate
 - Projects already started
 - Standards already available
 - Cooperation need between several players

References

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Disclaimer

AFOR makes hereby no suggestions regarding the use of the mentioned and related standards, documents and/ or concepts.

Questions and answers
