Fibre Networks as Green Assets

The Role of Sustainable Finance

December 2024

A report by Cartesian

Full fibre for a digital and sustainable Europe

Foreword

The FTTH Council Europe is pleased to bring you this first-of-its-kind study by Cartesian on FTTH as a green asset.

Within the FTTH Council Europe, we are relentlessly working to fulfil our mission: to advance ubiquitous full fibre-based connectivity to the whole of Europe. The FTTH value chain is also fully committed to contributing to the achievement of the EU climate goals.

This study aims to demonstrate the positive environmental impact of FTTH networks throughout their lifecycle, from production to deployment and operation. FTTH networks underpin the "twin transitions" ensuring the highest connectivity performance as well as a high energy efficiency, reducing the risk of rebound effects that can arise from higher data consumption. Finally, the study demonstrates how access to sustainable finance could help sustain the investments needed to achieve the Digital Decade targets.

We want to ensure that there is wide awareness about the results of this study, which contributes to increasing investors' confidence in the sustainability benefits of FTTH projects as well as informing policy makers on actions to ensure access to sustainable finance.

I thank the Cartesian team for their thorough work on this study and hope that you will find it a useful and insightful read.

Vincent Garnier
Director General
FTTH Council Europe

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1. Executive Summary

Growth in bandwidth demand continues unabated, as connected devices used by “digital” consumers multiply to meet their communication, entertainment and information needs.

Enterprises also continue their digital transformation, including relying more and more on digital channels to serve and to communicate with their customers and providing flexibility to their workforce, with the “hybrid” working model becoming entrenched beyond the necessities of the COVID pandemic.

Both consumer and business users expect to be able to access the services they need seamlessly and securely from multiple devices and multiple locations. They increasingly rely on data-intensive applications that make life easier and the environment smarter, whether by ensuring better performance for public services, by supporting healthcare and education, or to navigate a city, to access buildings or to purchase products and services.

In short, the digital transformation of European economy and society enabled by Information and Communications Technology (“ICT”) services and capabilities bring irrefutable social and economic benefits.

In this White Paper we will demonstrate that FTTH[1] networks play a key role in unlocking these benefits while leveraging technologies and approaches that minimise any adverse environmental impact, hence supporting the twin transitions (digital and green):

- Fixed network data consumption in Europe is expected to grow at 20% CAGR to 2030 from 2022 base, i.e. from 220 GB/month to 900 GB/month per household. Fixed network traffic accounts for 94% of total (fixed+mobile) data consumption in 2022 and 92% of total in 2030. As such, fixed networks play a pivotal role in terms of minimising the potential rebound effect linked to higher data consumption;
- FTTH networks are highly efficient throughout their lifecycle, from production, to deployment, to in-life operations, and support the circular economy;
- Production of fibre cables only generates between 2.3-3.07 kg of CO2 per 1 km of cable (vs. 10.8-15 kg of CO2 generated to produce 1 km of copper cable) and have longer life spans and higher transmission capacity compared to alternative network technologies (xDSL and Cable);
- FTTH networks are very efficient in their deployment: they have a more streamlined architecture compared to xDSL and Cable, relying on a smaller number of network elements, with smaller power requirements. Furthermore, FTTH operators use modern techniques (es. Micro-trenching and reuse of infrastructures) during network roll-out;
- Power consumption for FTTH access networks (excluding CPE) is over 7 times lower compared to VDSL2+ access networks and 6 times lower compared to Cable access networks;
- FTTH networks support the circular economy and deliver significant environmental benefits associated with the decommissioning of legacy copper networks: each ton of recovered copper eliminates 2.8 tons of CO2 emissions which would result from the extraction on each ton of newly mined copper;
- Expanding European FTTH population coverage from current 65% to 99% would translate in the additional FTTH customers generating 148k tons of CO2 emissions per annum, much fewer than the 1.1m tons that they would generate if they were using a VDSL2+ network;
- FTTH networks support the Smart Grid, Smart Building and Smart Utilities capabilities that underpin Smart Cities’ potential and help achieve sustainable development across multiple sectors and domains.

Telecom operators across Europe continue to deliver investment to support these developments which are also in line with the European Union’s Digital Decade connectivity objectives, with FTTH playing a key role in meeting customer demand for fast and reliable broadband services.

Actors across the FTTH network value chain should continue to highlight and evidence FTTH "Green" credentials to increasingly tap into "Sustainable Finance" resources, which will be critical if Europe is to continue to play a role as global leader in the Digital Economy. In fact, investors should be encouraged to positively assess and finance FTTH projects which embody the life-cycle efficiencies and best practices described in this White Paper.

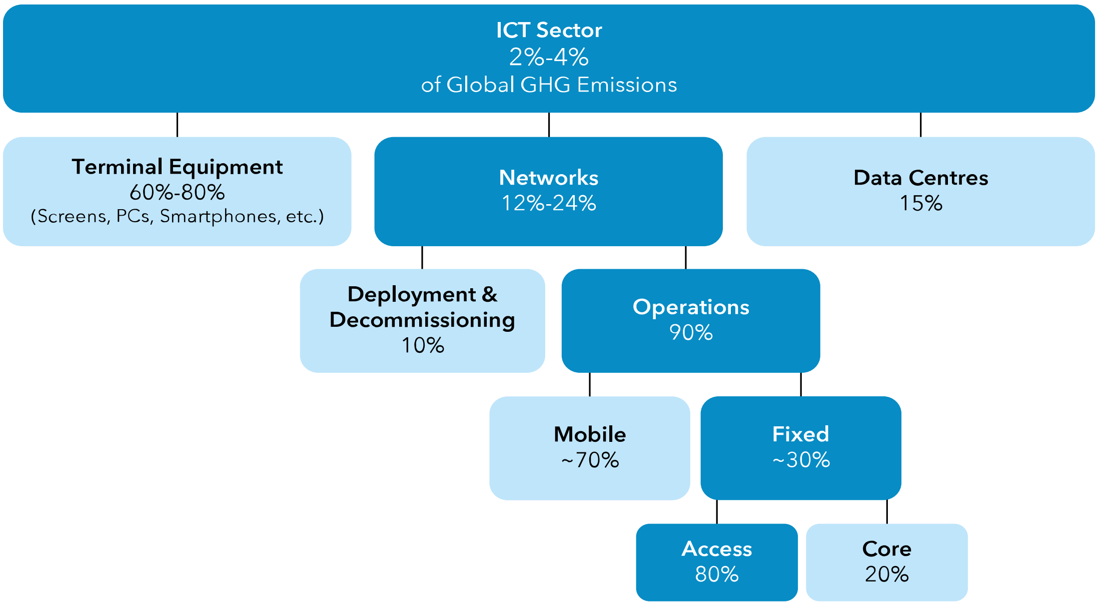
Regulators and policymakers can further facilitate access to Sustainable Finance for FTTH projects by evolving current scope of the EU Taxonomy[2] and the definitions of "Green Investment" to support the recognition across the Investor community that Information and Communication Technology ("ICT") and specifically FTTH networks are environmentally sustainable.

2. FTTH Networks Efficiently Supporting Data Demand

The digital transformation of European economies and society are supported by ICT services and capabilities. While the benefits of a digital society are irrefutable and aligned with the EU's Digital Decade objectives (and the objectives of similar initiatives outside the EU such as the UK's 2024-2030 Digital Development Strategy) and also support the European Green agenda, there is concern around a potential "rebound" effect, i.e. that while ICT enables reduction in GHG emissions in many sectors and domains, the massive growth in demand for digital services could lead to significant escalation of ICT's own GHG emissions.

Today, ICT accounts for between 2% and 4% of global Greenhouse Gases ("GHG") emissions[3], a comparable number to the global aviation sector[4] and some studies provide alarming predictions on the rebound effect, suggesting that ICT's global GHG share could grow to 14% by 2040[5].

Figure 1. ICT Global Greenhouse Gases Emissions and Role of Fixed Access Networks



Source: WIK Consult, Cartesian

It is therefore critical that investors in ICT remain keenly aware of the potential "Rebound" effect and focus their investments on solutions and capabilities with the lowest possible environmental impact.

While the increase in Data Centres' energy consumption is expected to be the main driver of growth in ICT's overall GHG as data-processing intensive AI applications proliferate, networks can help reduce any rebound effect by ensuring that data connectivity and transmission needs are met in the most sustainable way: for instance distributed FTTH networks enable smaller "Edge" Data centres closer to the end users reducing cooling requirements and optimising components and space used compared to large scale data centres[6].

In general, fixed networks will play a pivotal role in terms of minimising the potential rebound effect linked to higher data consumption: notwithstanding the increasingly important role of mobile networks in the ICT sector, fixed networks are expected to continue to carry the lion's share of data traffic.

Fixed network data consumption in Europe is expected to grow at 20% CAGR to 2030 from 2022 base, from 220 GB/month to 900 GB/month per household. These fixed network traffic levels represent 94% of total (fixed+mobile) data consumption in 2022 and 92% of total in 2030[7].

There is indeed strong evidence that FTTH investment is improving sustainability of fixed network access throughout the network lifecycle including:

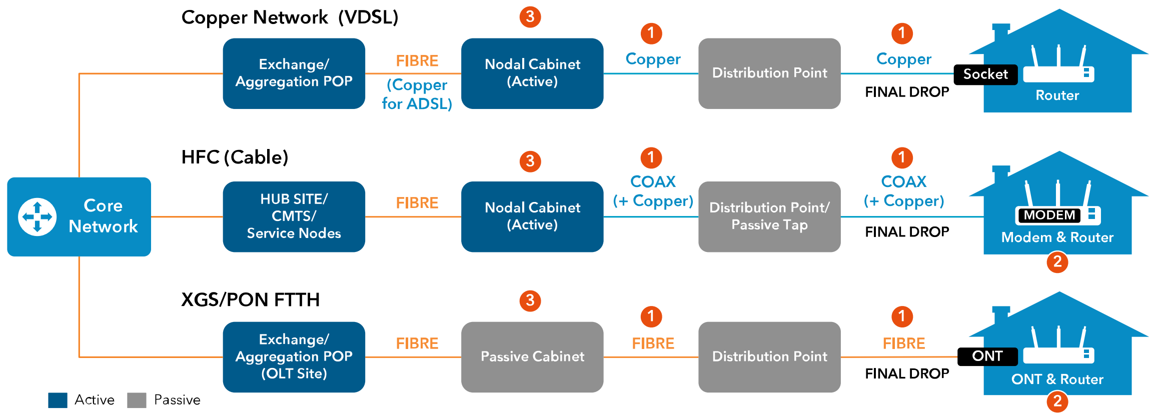
- The production phase, related to the production of all relevant network materials and components, including microduct connectors, ducts, cables, network devices, power units, etc.
- The deployment phase, which involves the shipping of materials and components in the required locations and the network installation activities including civil engineering works to create the underground, overground or overhead space to accommodate the network itself, for instance digging trenches and chambers and installing cabinets or poles.
- The operations phase, which involves powering up, activating and operating the network so that customer devices can be connected for customers to enjoy a variety of services including video, web services and applications.

Production

The manufacturing and transportation of equipment is estimated to drive ~ 10% of fixed networks' GHG emissions over the network's life cycle[8]. FTTH delivers significant benefits in production sustainability compared to copper-based technologies:

- FTTH most often employs a Passive Optical Network (PON) architecture, meaning that no active equipment is required across the access network, including nodal cabinets and distribution points. Furthermore, PON network design relies on a lower number of network elements compared to xDSL and HFC. As consequence, FTTH requires fewer and more centralised power distribution units.

Figure 2. Copper vs HFC vs FTTH Access Networks



1 Copper vs Coax vs Fibre

- VDSL networks use copper cable from the nodal cabinet to the premises (from the exchange for ADSL)
- HFC Network use Copper-coated Alluminium coaxial cable from nodal cabinets to premises, at times bonded with twisted copper cables to provide telephony
- XGS/GPON utilise fibre all the way to the home (FTTH)

2 Network Terminal & CPEs

- Copper networks terminate in a socket from where internal wiring is connected to CPEs (Router)
- HFC network required Modem equipment to terminate connection, often combined with routers
- FTTH networks terminate in an Optical Network Termination ("ONT") unit, which is sometimes combined with CPEs

3 Access Network Cabinets

- FTTH (e.g. XGS/PON) does not require active elements in the access network
- VDSL networks have active elements (VDSLAM/Converters) in Nodal cabinets
- HFC Networks require active equipment that converts fibre optical signal to radio frequency signals transmitted over Coax

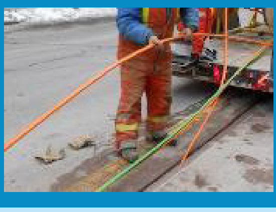
- Fibre networks are less prone to electromagnetic interference and signal attenuation. Therefore, compared to copper networks they have longer reach hence requiring fewer sites and less equipment: when transmitting at 1Gbps signal attenuation over 100m is approximately 3%, while signal is almost completely lost (90% attenuation) once a copper cable length exceeds 100m[9].
- Variation in number of devices has obviously an impact on production intensity. Equipment weight has been used as a proxy for production intensity and emissions: a Germany-wide estimate calculated that deploying FTTH network instead of FTTC would avoid 48,000 tons of weight for the system technology including network termination devices, saving 1100MW of energy required for manufacturing[10].
- Fibre cable is mostly composed by silica, which is easily recyclable and one of the more widely available natural resources on earth, while copper cable which is used in xDSL and HFC networks requires mining and extraction, which has significant and increasingly severe environmental impact[11]. Fibre cable is also lighter than copper cable and smaller in size (a fibre cable is only 15% of the size of a traditional copper cable)[12]. As a result, the production process for 1 km of copper wire generates, between 10.8 kg and 15 kg of CO2, while fibre cable only generates between 2.3kg and 3.07 kg of CO2 per 1 km of cable[13,14] while supporting much higher transmission capacity[15].
- Asset lifespan of Fibre cables is much longer than copper cables: fibre cables have been in uses in some cases for over 30 years, and it is estimated that they can operate effectively for 40 to 50 years while copper cables may deteriorate more rapidly, in some extreme cases in as little as 5 years[16];
- Developments in ducts and conduits production techniques leveraging recycled materials have overcome traditional objections regarding the quality and durability of ducting made of recycled materials. Ducts made of 100% reground High-Density Polyethylene have now performance equivalent to traditional duct products, including in ducting laying and high-pressure fibre cable blowing[17].

Deployment

As mentioned earlier FTTH networks have a more streamlined and efficient architecture compared to xDSL and HFC, relying on fewer network elements, with smaller and more centralised power requirements.

FTTH network deployment is therefore already relatively efficient also considering that optical fibre enables higher density cables which – as mentioned above – favour utilization of existing ducts, but further efficiencies can be achieved through the use of low-impact fibre deployment techniques such as micro-trenching, by fibre installations on the side of buildings and by utilising and sharing existing civils infrastructure deployed by other telecom operators or other utilities (water, power utilities).

Figure 3. Sustainable FTTH Deployment Approaches

MICROTRENCHING (OR SLOT TRENCHING)	PASSIVE INFRASTUCTURE ACCESS	SHARED UTILITIES INFRASTUCTURE
		
• Cuts thin slot in (typically) road surface • Makes use of micro-ducts • Trench is cut and closed in the same day • Reduces civil work cost by 80%	• Use existing telecoms ducts (and poles) • Install alongside other fibre networks (or legacy copper if space is available) • Shared access	• Make shared use of water, gas or energy pipes for fibre deployment • Decreases need to deploy civil works, reducing cost on operators • Coordination with utilities at times challenging

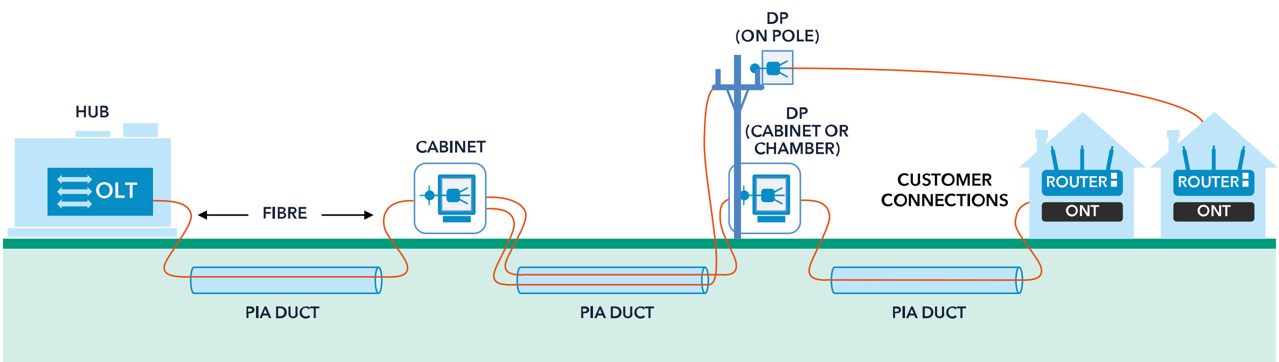
Users in areas covered by shared networks can be connected with limited waste of resources. This is achieved through an incumbent operator or alternative infrastructure provider building a FTTH network and opening it up to wholesale access for multiple operators, who don't need to deploy duplicate infrastructure.

For instance, Stokab, a fibre company owned by a municipality in Stockholm, developed a 9,500 km fibre network with over 350 fibre access points, that currently hosts 900 customers and more than 100 operators and service providers. Stokab installed its fibre in ducts across Stockholm, and the ducts have sufficient capacity to to serve the population for the years to come. In each 110mm duct there is space for 4 sub ducts, each of which is capable of holding up to 1,000 fibre strands[18].

In Berlin, Eurofibre Netz provides FTTH connectivity to thousands of households using the existing infrastructure of the district heating network in the Vattenfall area of the City[19].

Elsewhere, in cases where networks were not originally built as shared resources, regulatory action throughout Europe has ensured that telecommunication operators with Significant Market Power are required to provide Passive Infrastructure Access in order to facilitate competing operators' network deployments.

Figure 4. Passive Infrastructure Access in Ducts and Poles



The environmental benefit of this network and infrastructure sharing approach is very significant: a greenfield underground deployment can be up to three times as cost and resource intensive compared to brownfield deployments[20].

Energy Efficient Operations

The majority of fixed network GHG emissions (~90%) over its lifecycle occur during operational use[21]. The main drivers in Fixed Access Network's emissions are energy consumption related to network access and customer premise equipment ("CPE"), specifically network termination units and routers[22].

While power consumption related to CPE is relatively similar, independently from the network access technology – i.e. ranging between 10W for a VDSL Router and 18W for HFC home amplifier and router, with GPON ONT and Routers consuming ~13.5W[23] – the different design and higher performance of FTTH network compared to HFC and VDSL drives significant power reduction associated with network access.

For instance, it has been estimated that a VDSL2+ network serving ~25k customers with average bandwidth of 50Mbps per customer would require 538 street cabinets (+6 exchange locations). An HFC network of similar scale would require 794 fibre nodes and 12 Cable Modem Termination Systems ("CMTS"), whereas only 36 fibre nodes would be needed for a comparable FTTH Network[24].

The impact on energy consumption of these different designs is stark: power consumption in the access network (excluding CPE) is over 7 times lower in an FTTH network compared to a VDSL2+ network and 6 times lower compared to an HFC network[25].

In addition to energy efficiency, FTTH also delivers much higher capacity and has the potential to deliver even faster connections in the future without the need to build new networks, hence "future proofing" high-speed connectivity and its environmental impacts.

10Gbps symmetrical XGS-PON networks are already being deployed throughout Europe, and an established roadmap to symmetrical 50Gbps PON[26] already exists, while VDSL2+ networks deliver sub-100Mbps speed and DOCSIS 3.1 asymmetrical 10Gbps speeds (with upstream generally in the 150-200Mbps max range).

Figure 5. PON Standards Evolution

	GPON	XG-PON	XGS-PON	25GS-PON	50G-PON
Down/Up Speed (Gbps)	2.5/1.25	10/2.5	10/10	25/25	50/50
International Standard	ITU-T G.984	ITU-T G.987	ITU-T G.9807	Industry standard	ITU-T G.9804
Adoption	Mainstream for installed base, no new developments	For tactical use only	Mainstream for new coverage and GPON upgrade	Multiple commercial deployments	Early commercial deployments

Source: Idate

Furthermore, the streamlined nature of FTTH design, lower number of active elements, higher tolerance of fibre cabling and equipment to temperature extremes contribute to more robust networks with lower overall fault rates and need for fault repair visits: it is estimated that FTTH has three times fewer service truck rolls per customer per year compared to xDSL (0.13 vs 0.45)[27], with obvious benefits on service miles and emissions.

These FTTH network characteristics address one of the key concerns around rebound effect, by ensuring that higher data consumption does not translate in higher energy usage and GHG emissions.

FTTH networks deliver the required high-capacity connectivity very efficiently in terms of design, production and energy usage compared to legacy technologies, hence mitigating any "rebound" effect deriving from growth in data demand as consumer and businesses adopt data-intensive applications.

3. FTTH Network's Sustainable Supply Chain and Circularity

The mass deployment of FTTH networks is a relatively recent phenomenon: as recently as 2017 only ~10% of broadband connections in Europe were based on FTTH technology[28].

As such most FTTH networks have been deployed in the context of heightened awareness of sustainability imperatives, which has led FTTH investors and operators, also with stimulus by many Governments and Regulatory Authorities throughout Europe[29], to adopt virtuous behaviours.

Reducing GHG Emissions

FTTH network operators are both pursuing energy efficiency and promoting the use of renewable sources in their own operations, driving down "Scope 1" and "Scope 2" emissions, and expending significant efforts in monitoring and shaping FTTH's operators Supply Chain in the direction of better sustainability, for instance by reducing the use of fossil-intensive materials (plastic) and of non-recyclable packaging[30] with beneficial effects in indirect "Scope3" emissions.

These efforts have yielded many tangible results and spurred ambitious commitments for GHG emissions reduction, for instance:

- Eurofibre Group's GHG reduction targets have been approved by the Science Based Targets initiative (SBTi). Eurofibre is targeting 90% reduction in Scope 1 and 2 emissions by 2030 compared to 2021 base (as well as a 30% reduction in Scope 3 emissions)[31];
- Open Fibre is also working to meet SBTi's GHG reduction trajectory, with clear plans for a 42% reduction of emissions (compared to 2022 base) by 2030 and by 90% by 2040 across Scope 1, 2 ad 3 emissions[32];
- Iliad estimates a reduction of 15% of energy consumption in the operations by 2025 (baseline 2019);
- Many vendors are committed to contributing to the EU climate goals, and their efforts are evidenced through the most advanced sustainability reporting standards.

As illustrated by the above examples, the FTTH Council community is strongly focused on GHG emissions challenges. Furthermore, the FTTH Council is co-leader in the Green Digital Action track (GDA) of the ITU for the UN Climate conference (COP28 and COP29). Within the GDA, the Council is active in the pillar 'ICT sector GHG Emissions' and the related Calls for Actions for setting CO_2 reduction targets in line with the Paris Agreement and communicating transparently about GHG emissions[33].

These efforts are matched by the broader telecommunication industry. For instance, the members of the Connect Europe (formerly known as ETNO) group of operators have increased the share of renewable energy they use from 60% to 80% over five years (2018-2022)[34], and some operators like Telia and Deutsche Telekom are already sourcing 100% of their energy from renewable sources[35].

Circular Economy

An additional important effect of FTTH deployment is their potential to replace and make redundant legacy copper networks.

For example, a single fibre optic cable containing 144 optical fibres has a huge theoretical capacity of about 86M Gigabits per second over a distance of at least 20 KM. To achieve 0.01% of this theoretical capacity over 20 copper cables would be required[36].

Copper is also an extremely precious material: its price in the commodity market has doubled in the past 4 years, and its demand is expected to increase by 230% by 2030, mainly as result of demand for Electric Vehicles[37].

Since 2.8 tons of CO2 emissions reduction can be claimed for each ton of copper recycled in lieu of freshly mined copper[38], the environmental benefits of replacing legacy copper networks with fibre are significant: BT alone estimates that switching off their copper PSTN network would enable the recovery of 200,000 tonnes of copper, which would help avoiding copper-mining emissions of up to 600k tons of CO2[39].

Beyond copper, manufacturers and operators are also focusing on the recovery of other materials, such as plastics, and applying best practices from other industries in the re-use of materials for new products[40].

FTTH networks investors and operators are pro-actively adopting sustainable practices in their deployment and operation and can support circular economy in terms of equipment re-use and materials recycling.

4. Connectivity Underpins Sustainable Development in Europe's Digital Economies and Societies

Connectivity has a central role in digital economies and societies: the availability of fit-for-purpose secure and robust networks able to deliver high data throughput and low latency are key enablers of environmental sustainability and Greenhouse Gases ("GHG") reduction in multiple industries and domains.

While there is awareness that the ICT sector is responsible for significant amounts of GHG emissions, ICT enables many areas of our economies and societies to meet their own GHG emission reduction ambitions by a much larger extent, resulting in a significant net benefit.

Some estimates suggest that the ICT sector can enable a 15%to 20% reduction in GHG emissions in multiple sectors of the economy, i.e. 7 to 10 times larger than ICT's own emissions.[41, 42, 43, 44]

This enablement is visible across multiple sectors and use cases, with Smart Cities and Smart Grid use cases providing the most compelling applications to deliver efficiencies and to eliminate waste, leading to lower energy intensity. Furthermore, reliable connectivity also enables remote interactions in education, medicine, work and commerce, with significant savings in terms of miles travelled and emissions of transportation[45].

FTTH networks support Smart Grid, Smart Building and Smart Utilities environments that underpin Smart Cities' potential. They provide reliable and efficient connectivity to the Devices, Sensors and Applications that capture and process vast amount of data. These data are used to inform the operation of complex systems such as transport, water and waste management infrastructure as well as the actions and behaviours of individuals in their daily life, for instance a commuter taking an alternative route to avoid a traffic jam.

In recent years we have seen fixed telecom network operators driving this type of applications from smart city lightning in Germany to smart energy storage and distribution in Estonia and Finland[46].

The Smart Lighting solution provided by Deutsche Telekom involves deployment of a central cloud-based lighting management application fed with data collected by sensors placed in the vicinity of lighting fixtures, enabling the creation of a dynamic street lightning system that can manage start and stop times of lighting cycles, determine brightness by area etc, resulting on energy savings of up to 70%.

Smart energy applications like Elisa's Distributed Energy Storage (DES) in Estonia and Finland uses lithium-ion batteries and AI and Machine Learning serving both telecommunications networks and electricity grid operators. The solution enables real time load-shifting that automatically adjusts electricity consumption from grid to storage and back during different periods of the day and supports market participation, including selling power back to the grid in times of need. Elisa calculated that DES could save up to 50% of a company's electricity costs.

More broadly, smart energy applications can be implemented across entire grid systems ("smart grid"), through fibre networks delivering low latency and high-speed connectivity to meet latency-sensitive smart grid applications demands. The data on electricity consumption and usage can be transmitted in real-time to all network operators to optimize the production and distribution of electricity, to save energy, to reduce losses, and to improve grid reliability[47].

In short, these trends have a beneficial sustainability impact, but they also underpin increased reliance on a broad range of ICT assets.

High-capacity data transmission delivered by FTTH networks underpins Digital economies and societies and helps achieve sustainable development across multiple sectors and domains.

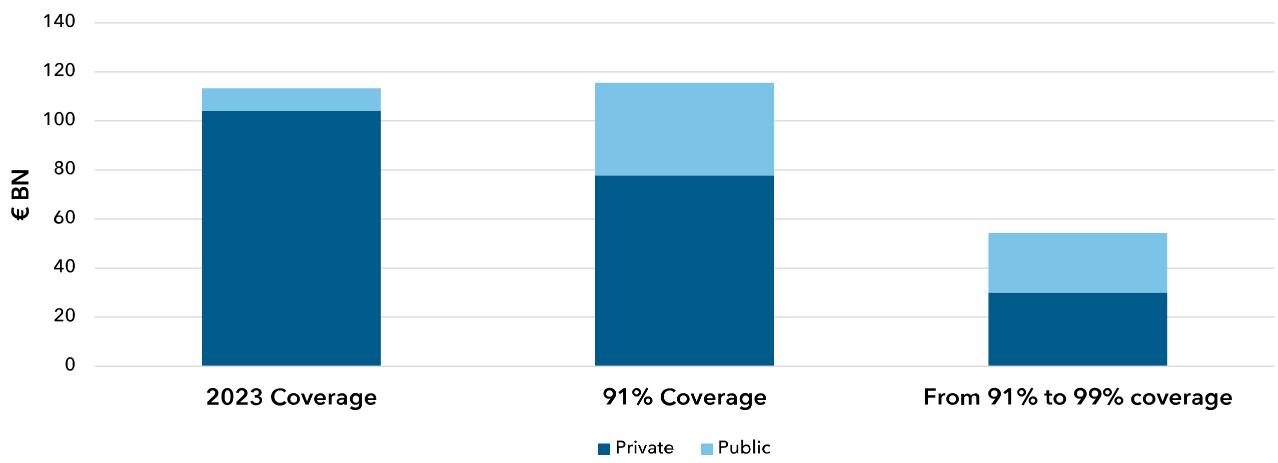
5. FTTH as Green Investment

In 2022 investment in Fixed Networks by Operators in Europe was over €28bn - 90% of which (€25.5bn) in FTTH[48]. The cumulative amount spent per capita on FTTH in Europe stood at EUR296 by the end of 2023[49].

These investment efforts have pushed European FTTH population coverage to 65%[50] by the end of 2023. However, while Europe maintains its lead over the USA (where high-speed internet is still delivered mainly via cable) China is further ahead at 98.5% population coverage. Additionally, overall Europe remains behind on gigabit-capable networks (i.e. including cable), being in the lower median fixed downlink speeds compared with the USA, China and Japan[51].

To meet growing demand and to ensure parity with global leaders in gigabit-capable networks and to meet the EU's Digital Decade objectives large and small operators throughout Europe will need to continue to invest: AnalysisMason estimates that exceeding ~90% FTTH population coverage would require a future investment similar in value to the investment deployed so far to reach today's population availability of 65%. Ubiquitous coverage (99%) would require further significant resources to ensure that FTTH availability spreads also to less densely populated and remote areas[52].

Figure 6. Actual and Expected Investment in European FTTH Deployments



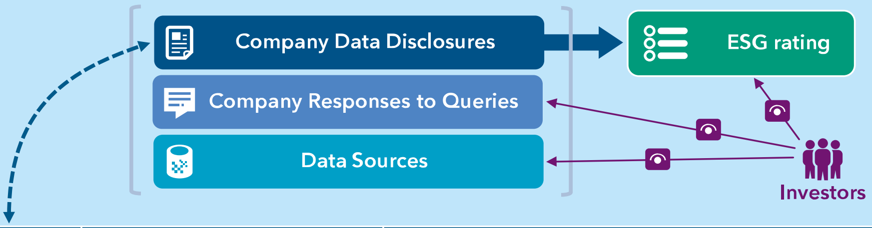
As we have seen in the previous sections of this White Paper, FTTH allows more efficient delivery of high data rates compared to copper-based technologies, hence making a direct positive contribution to the reduction of GHG emissions of fixed networks. It is estimated that FTTH networks generate (excluding CPEs) ~3.5kg of CO2 per active customer per annum, compared to ~26.5kg of CO2 p.a. for VDSL networks[53]. On this basis, and assuming current customer uptake rates, an expanded population coverage from 65% to 99% would translate in the additional customers generating ~148k Tons of CO2 emission per annum when using a FTTH network compared to the ~1.1M Tons that they would generate if they were connected via VDSL[54].

Furthermore, indirect contribution to reduction of the GHG emission would also be released by enabling a myriad of energy saving use cases in multiple sectors across a broader footprint.

By highlighting and evidencing their Green credentials FTTH networks can tap into huge sustainable finance resources to meet their investment needs.

Reliable company data disclosures, based on clear regulatory frameworks and auditable measures are key for Investment companies to take informed Sustainable investment decisions

These, together with other data sources such as responses by Companies to specific information research and other data facilitate growth in Sustainable Finance.



	Sustainability Measurements	Key Indicators and Outputs
Company Data Disclosures	EU Taxonomy	Shows Investment benefits one of the six Green targets without harming any of the others
	European Green Bond Standards	Voluntary standard that relies on the detailed criteria of the EU taxonomy to define green economic activities and establishes supervision of companies carrying out pre- and post-issuance reviews at European level.
	EU Climate Benchmarks	Benchmarks that consider the carbon footprint of underlying assets is aimed at assisting investors who are looking into sustainable investment products.
	Science-Based Targets Initiative (SBTi)	Science-based targets show businesses how much and how quickly they need to reduce their greenhouse gas (GHG) emissions to prevent the worst effects of climate change.
	Other Voluntary Disclosures	E.g. Transition plans

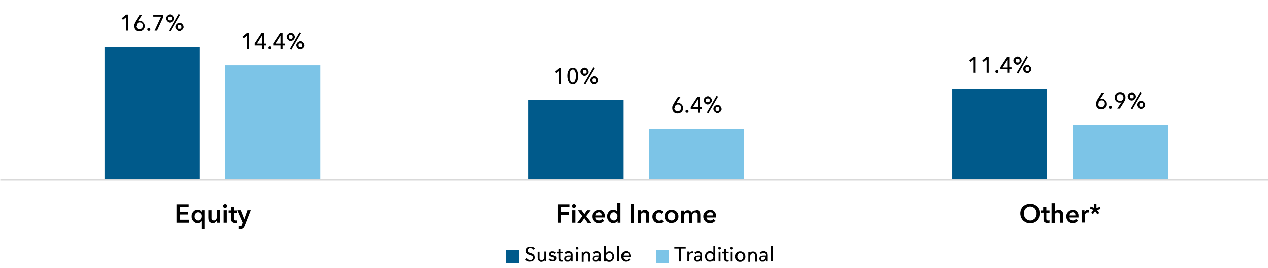
While sustainable finance has recorded a slowdown in the past two years, also due to global geopolitical uncertainties, the market value of Sustainable funds continues to grow (+7% in 2023) reaching a total value of $3 trillion by the end of 2023[55].

Issuance of new Sustainable bonds also continues, with $872BN of sustainable bonds issued in 2023 (3% year-on-year growth), reaching a total cumulative issuance of $4 trillion to date[56].

Sustainability credentials are increasingly important to consumer and retail investors, leading to 58 of the top 100 global institutional investors to report on their funds' sustainability performance[57].

This continued growth in Sustainable finance is also underpinned by sustainable investment performance, which is outperforming traditional investments across all main asset classes[58].

Figure 7. Sustainable vs Traditional FY23 Median Return by Asset Class



Source: Morgan Stanley Institute for Sustainable Investing analysis of Morningstar data as of February 9, 2024; * Other includes multi-assets, property, commodities, and alternative fund types

Sustainable Finance is already deploying significant resources in the ICT sector (~2% of the Sustainable bond market[59]), and a designation of FTTH Networks as "Green Investment" in the context of the EU Taxonomy and similar instruments may enhance the ability of FTTH operators to unlock additional Sustainable Finance's resources, with beneficial impact on Digital development and European GHG emissions.

The role of "Sustainable Finance" investors will be critical if Europe is to continue to play a role as global leader in the Digital Economy.

References

1. In this White Paper FTTH is shorthand for direct Fibre access to buildings and installations and includes Fibre To The Office ("FTTO"), Fibre To The Site ("FTTS"), etc.
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Regarding the FTTH Council Europe

The FTTH Council Europe is an industry organisation with a mission to advance ubiquitous full fibre based connectivity to the whole of Europe. Our vision is that fibre connectivity will transform and enhance the way we live, do business and interact, connecting everyone and everything, everywhere. Fibre is the future-proof, climate-friendly infrastructure which is a crucial prerequisite for safeguarding Europe's global competitiveness while playing a leading global role in sustainability.

The FTTH Council Europe consists of more than 160 member companies.

Please visit our website for more information: www.ftthcouncil.eu

About the Policy & Regulation Committee

The Policy and Regulation Committee is the cornerstone of the FTTH Council's strategy on Public Affairs. It brings together all members interested in shaping the Council's positions on public policy and regulation, and is under the supervision of the Executive Board and fully aligned with the vision and mission of our organisation.

Public vision and action are essential to progressing towards a sustainable and digital European society. We encourage policy makers to facilitate, through regulation, a fair and competitive market and to support investments in areas where the private business case does not exist.

For more information about our positions on policy and regulation, please visit the dedicated section of the website.

You can also access all publications from this committee by filtering "Policies and regulation" category in our Knowledge Center.

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