A whitepaper

Copper Network Switch Off Maximises the ROI for Fibre Networks and OPEX might be a Missing Part in the Equation

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Abstract

As the world becomes increasingly reliant on high-speed digital connectivity, the transition from traditional copper networks to Fibre-to-the-Home (FTTH) networks takes centre stage. This paper delves into the multifaceted landscape of this transition, exploring the intricacies of funding, investor focus, operational expenses (OPEX), and the imperative of quality build architecture. It delves deep into the transition process, analysing crucial factors that shape the success of this migration. Drawing from real-world case studies and industry insights, we uncover the strategies that drive successful FTTH rollouts while ensuring a substantial return on investment (ROI).

Introduction

In the ever-evolving technological landscape, access to reliable and high-speed internet connectivity has become a fundamental necessity. The transition from copper to fibre broadband network presents a pivotal step towards meeting this demand. The global agenda for copper network decommissioning is a prominent topic among incumbent telecom operators worldwide. In Europe, the momentum behind fibre rollout is continuously growing, with over 100 million households in the EU28 region now enjoying the ability to access fibre-to-the-home (FTTH) broadband. Concurrently, traditional copper-based broadband connections are steadily diminishing. Additionally, mobile-based broadband solutions are emerging as robust contenders, particularly in areas still reliant on copper-only infrastructure.

The primary impetus behind phasing out legacy copper networks extends beyond cost-saving measures. It encompasses the imperative to discontinue operationally inefficient, energy-intensive legacy technologies. This strategic move aims to liberate capital and resources for reallocation toward the delivery of high-capacity gigabit broadband, leveraging the most efficient and future-proof technologies available, such as fibre and 5G, among others.

Despite widespread consensus regarding the necessity of copper switch-off, several challenges persist. These challenges encompass pivotal decisions like determining the appropriate initiation time for legacy network shutdown, managing a multifaceted spectrum of stakeholders, including regulatory bodies, municipalities, wholesale and retail customers, and devising a meticulous migration strategy. This strategy seeks to minimise customer churn while concurrently enhancing customer experience and overall value.

This paper undertakes an in-depth evaluation of the primary issues confronted by telecom operators in overseeing the transition away from legacy copper networks. Moreover, it highlights essential success factors derived from operators who have effectively executed copper switch-off initiatives and orchestrated seamless migrations to embrace fibre and other cutting-edge technologies.

Funding Challenges and Government Intervention

The roll-out of FTTH networks is often impeded by funding challenges, leaving industry players to explore innovative solutions. As of August 23, funding has become scarcer, exacerbated by rising interest rates. However, the COVID-19 pandemic showcased the pivotal role of digital connectivity in sustaining economies during lockdowns. Governments, recognising this essential infrastructure's significance, have stepped in to allocate funds, particularly in rural areas. Case in point, some governments have redirected resources to bolster FTTH construction, illustrating how national interests align with digital expansion.

Investor Priorities and Changing Strategies

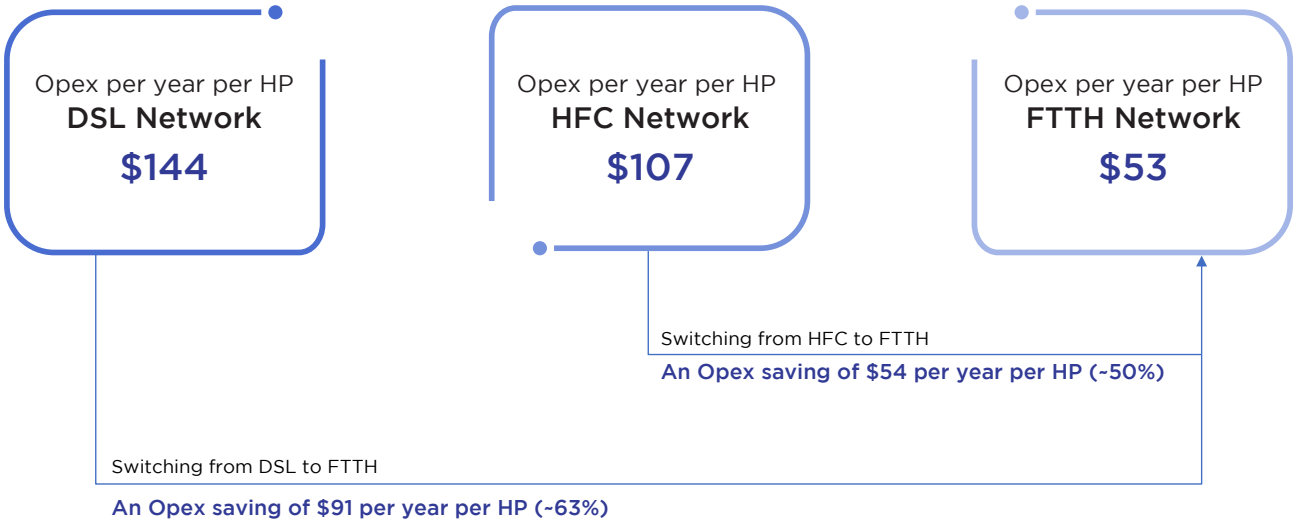
The evolution of investor priorities has had a profound impact on FTTH network construction strategies. Historically, the race to lay down infrastructure before competitors led to the "homes passed" approach. Call it land grab if you want. However, as financial returns gained prominence, a paradigm shift occurred towards the "homes connected" strategy. This transition signifies a move from land grabbing to revenue generation. The influence of take rates on ROI cannot be overstated, marking a shift towards sustainable profitability.

The Paradox of Copper Networks

While FTTH networks offer the promise of unprecedented data speeds, they face challenges in customer adoption. In contrast, legacy copper networks, despite their limitations, have been gradually upgraded to meet growing demands. Despite the high capital expenditure (capex) required for FTTH rollouts, the Fibre-to-the-Home Council Europe's average cost per home passed is around $1200, with an additional $200-300 to convert them to connected homes. However, disparities arise based on geography, with rural connections being significantly costlier than urban ones. Deployment cost variations are huge and factor four is a number we pick up from many operators we collaborate with. (we lost a lot of original data, no???) ROI of the more remote areas, that cost far more than this average $1200, is almost impossible to generate a proper payback. Here in somecases governments step in through legislation or investment support programs. These are areas where conversion from copper to fibre connectivity remains more challenging. But can opex help?

Unravelling the OPEX Dilemma

Operational expenses (OPEX) are a lesser-discussed yet crucial aspect of ROI. Studies reveal that FTTH networks demonstrate lower OPEX than DSL and HFC networks. The Fibre Broadband Association's study indicates that OPEX for FTTH networks averages around $53 per home passed per annum. Verizon's case is illuminating—20 years into their FTTH rollout, they report OPEX for their fibre network is approximately 60% lower than for their VDSL network. With other operators (in the US, but we can assume without too much concerns similar results across the globe), the study shows that DSL networks have an annual OPEX per year per line of $144 and $107 for HFC networks.



Leveraging OPEX Savings for ROI

OPEX savings have the potential to transform FTTH ROI dynamics. By employing the hypothetical scenario of utilising OPEX savings to offset capex, which means one decomissions the legacy copper network, the break-even point for the investment can be accelerated. This calculation provides an encouraging outlook, with the potential to realise the capex payback in as little as 13-24 years by using opex saving in the return model. The opex saving ranges from $54 to $91 depending on the copper network technology (DSL versus HFC).

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

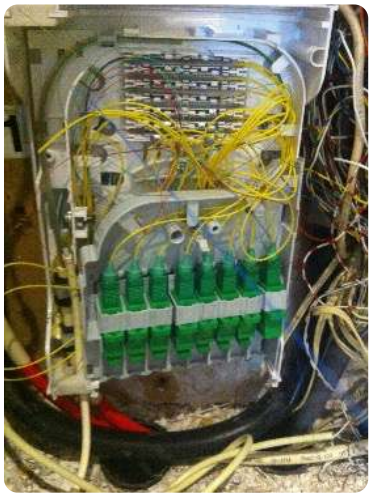
*Not considering the additional revenue streams and capex savings due to technology enhancement

Switching Off Copper Networks: A Delicate Balancing Act

This can only be realised when the network operator decommissions its copper network and stops spending the opex related to this network. Transitioning from copper to fibre networks requires careful navigation of several factors. Regulators play a crucial role in orchestrating the copper network switch-off process. Challenges include labour-related aspects and user reluctance to migrate from familiar technology. Government intervention can accelerate this process, fostering economic growth and regional competitiveness through enhanced connectivity. Regulations could for example require operators to offer a basic connectivity service at a competitive price for the people that would remain on the copper network.

Quality Build Architecture for Long-Term Viability

The long-term success of FTTH networks hinges on quality build architecture. Meticulous attention to infrastructure design ensures minimal OPEX and maintenance costs. A case-by-case analysis of FTTH installations across Europe reveals the stark contrast between well-built and subpar networks. The latter faces the looming threat of spiralling OPEX, which ultimately trickles down to users and the ROI model that uses opex as an element of the returns.



Assuring Quality Infrastructure, A Preemptive Approach

Assuring quality infrastructure demands a preemptive approach. Organisations must set clear, measurable OPEX targets from the outset and subject their build processes to rigorous scrutiny. Tier 2 operators and altnets must also navigate the regulatory landscape to ensure smooth transitions to fibre-based services.

Case Studies on Telcos FTTH acceptance over Copper Networks:

Telenor's Sunrise Project - Revolutionizing Legacy Network Decommissioning

Norway's telecom landscape witnessed a significant transformation over the last decade. The number of legacy customers, including POTS and DSL users, experienced a steep decline, prompting Telenor to embark on an ambitious project known as "Sunrise" in 2019. This case study delves into Telenor's journey towards switching off its legacy copper network by the end of 2022 and the strategies employed to ensure a smooth transition.

Engagement with Stakeholders

Telenor's commitment to stakeholder engagement stood out as a cornerstone of their strategy. Despite regulatory requirements necessitating the copper network's operation until 2025 for wholesale customers, Telenor actively collaborated with stakeholders to provide equivalent replacement wholesale solutions. A continuous dialogue with regulators regarding an earlier switch-off demonstrated their proactive approach.

Customer-Centric Solutions

One of the innovative aspects of Telenor's approach was addressing customer complaints promptly. Legacy network-related issues were resolved by offering customers equivalent products based on fibre, mobile, HFC, and specialised solutions. This not only served as a migration test case but also acted as a marketing incentive for other households to upgrade their legacy products voluntarily.

Municipal Engagement

Telenor engaged with almost every municipality in Norway where legacy networks operated. Their approach involved granular, home-by-home planning for replacement solutions. Beyond mere network decommissioning, discussions encompassed expanding the network footprint, facilitating fibre network growth, and deploying mobile-based solutions in rural areas. Gaining buy-in from municipalities and local agencies significantly streamlined the network.

Organisational Synergies

The Sunrise project fostered greater cooperation between Telenor's fixed and mobile divisions. Ensuring a seamless end-user experience post-switch-off required mobile-based solutions. This alignment not only enhanced the fixed experience but also alleviated pressure on the mobile network.

Managed Fixed Wireless Access (FWA) Solutions

Telenor's commitment to customer experience was evident in their approach to FWA replacement products. The company managed the cost per engagement as a managed service to ensure superior quality. This included professional equipment installation, dedicated access infrastructure in rural areas, and redundant backhaul and power connections. Their 4G/5G FWA solution, complete with outdoor antennas and indoor Wi-Fi routers, was tailored to rural customers transitioning from legacy copper-based products.

Environmental Impact

The Sunrise project's environmental benefits cannot be understated. The switch-off program is expected to save up to 100 GWh of electricity annually, reduce the need for 140,000 kilometres of copper cables, and free up indoor space for repurposing.

Observation

Telenor's Sunrise project exemplifies how proactive stakeholder engagement, customer-centric solutions, municipal collaboration, and organisational synergies can drive the successful decommissioning of legacy networks. Beyond the environmental benefits, this case study underscores the importance of delivering an enhanced customer experience throughout the transition, ultimately reshaping Norway's telecom landscape.

Openreach UK - Navigating the Copper Switch-Off Challenge

The United Kingdom has witnessed a remarkable shift in its approach to fibre rollout, with operators like Openreach, CityFibre, Community Fibre, Hyperoptic, Gigaclear, Netomnia, G.Network, Glide, and others embarking on ambitious plans. Openreach, as the incumbent, set a monumental goal of delivering fibre to 25 million homes by 2026. This case study delves into Openreach's journey towards completely switching off its legacy copper network, focusing on stakeholder engagement and the challenges faced.

Engagement with Diverse Stakeholders

Openreach's strategy for the copper switch-off emphasises engaging constructively with a diverse range of stakeholders. With over 5,000 exchanges nationwide, their approach is exchange-by-exchange and municipality-by-municipality. Commencing in Salisbury in 2021, Openreach recognises the critical importance of collaboration with government bodies, municipalities, regulators, vendors, suppliers, and both wholesale as well as retail customers. Richard Allwood, Openreach's Chief Strategy Officer, underscores this approach as essential for successful implementation.

Public Consultation

Openreach initiated an industry consultation process in March 2019, outlining its intent to switch off the legacy copper network, proposed approaches, and the timeline for the switch-off. Key stakeholders provided feedback, with challenger operators advocating for open access to the underlying infrastructure for all fibre operators. This consultation process aimed to avoid the monopolisation of fibre infrastructure.

Transitioning to IP-Based Infrastructure

One of the challenges Openreach faces is transitioning end services and intermediate service infrastructure to an IP-based solution. Collaboration with governments and critical service providers to upgrade their legacy customer-premise infrastructure to IP-based solutions is essential.

Stepwise Implementation

Build - Fibre is deployed to the premises in the exchange area, fully replacing the legacy copper infrastructure.
Stop Sell - Only fibre- and IP-based products are offered in areas with fibre coverage, while sales of legacy copper-based products cease.
Parallel Running - During the migration period, both the legacy copper network and the new fibre network operate in parallel. Customers are actively engaged to migrate to fibre-based products.
Withdrawal - All legacy products are withdrawn from the market.

Pragmatic Connectivity Solutions

Recognising the limitations of fibre infrastructure in some areas due to cost and operational factors, Openreach adopts a pragmatic approach. Fixed wireless or mobile solutions are deployed when feasible. In certain cases, the FTTC infrastructure is retained temporarily until a future-proof alternative is found.

Challenges and Progress

Despite meticulous stakeholder engagement and proactive publicity, Openreach acknowledges that the copper switch-off program is progressing slower than planned. A key constraint in expediting copper switch-off is the pace of fibre rollout. Regulatory changes easing pricing regulations on fibre have the potential to accelerate the rollout, addressing this challenge.

Observation

Openreach's journey towards switching off its legacy copper network reflects the intricate interplay between stakeholder engagement and the pace of fibre deployment. This case study underscores the importance of navigating diverse stakeholders, public consultation, and a meticulous stepwise implementation approach. While challenges persist, regulatory changes signal potential progress, making the UK's copper switch-off a dynamic landscape to watch.

Jersey Telecom - Pioneering the World's First Copper Switch-Off

Jersey Telecom, situated on the island of Jersey, a British Crown dependency with a compact 120 sq. km area and a population of approximately 110,000 inhabitants, emerged as a trailblazer in the full copper-to-fibre migration. Managing Director Daragh McDermott proudly reported their achievement of being the world's first operator to upgrade 100% of their legacy copper network to fibre. They not only accomplished this colossal feat but also seamlessly migrated all customers to the new network and entirely switched off the legacy network in December 2019.

Clear Objective and Strategic Focus

Jersey Telecom embarked on this transformative journey in 2012 with a clear objective: replacing all copper connections with fibre and switching off the copper network. Their approach comprised several strategic phases. They began by aggressively fiberising the entire network, utilising existing duct infrastructure for efficient fibre deployment. Next, they focused on customer migration to the fibre network and finally executed the crucial step of shutting down the copper network.

Government Ownership Synergies

As a government-owned entity, Jersey Telecom enjoyed the flexibility to make decisions in the long-term interest of both the country and the company. This unique position allowed for seamless coordination with various government agencies to resolve infrastructure-related challenges. The synergy between government ownership and telecom operations proved instrumental in executing the copper switch-off strategy.

Effective Communication

Communication was a constant thread throughout this journey. Jersey Telecom engaged in relentless communication through various channels, including media, direct customer engagement, and regulatory agencies. This proactive approach ensured that all stakeholders and users were well-informed about the transition to fibre and understood that it was the sole alternative for legacy-based products.

Phased Migration Approach

Jersey Telecom's migration strategy was phased and customer-centric. Initially, legacy broadband customers were transitioned to fibre-based alternatives from 2012 to 2018. Subsequently, the focus shifted to migrating legacy voice-only customers to fibre-based solutions. Throughout this process, customers were kept informed at every juncture, fostering a sense of involvement and understanding.

Engagement with Customer Suppliers

Recognising the intricacies of customer-premise equipment and the need for a smooth migration, technicians engaged directly with business customers and their suppliers. This collaborative approach aimed to identify solutions for legacy equipment and ensure a seamless transition for customers. By addressing customer-supplier relationships, Jersey Telecom demonstrated a commitment to the success of its copper switch-off program.

Observation

Jersey Telecom's pioneering achievement of becoming the world's first operator to switch off copper and achieve full fibre migration serves as an exemplary case study. The success hinged on a well-defined objective, strategic focus, government ownership advantages, effective communication, phased customer-centric migration, and engagement with customer suppliers. In a relatively small geographical area, they set a precedent for the global telecom industry, underscoring that a well-executed copper switch-off is indeed feasible with meticulous planning and dedication. Jersey Telecom's remarkable journey stands as an inspiration for telecom operators worldwide seeking to embrace the fibre future.

Telecom Italia (TIM) - Leveraging Legacy Copper Assets to Accelerate Fibre Rollout

Telecom Italia (TIM) announced its ambitious copper switch-off program in 2017, with plans to migrate 65% of its nearly 10,000 exchanges from copper to fibre by 2023. However, this endeavour faced challenges, primarily due to the lack of alternative fibre networks. Italy was historically a slower adopter of fibre technology in Europe. This case study explores TIM's journey and the pivotal role of collaboration with investors and competitors in advancing its copper switch-off program.

Monetizing Legacy Networks

In recent years, Italy witnessed a series of transformative events that propelled the country towards almost nationwide fibre coverage by 2025. Key among these was the emergence of alternative fibre players like Open Fiber. Equally significant was TIM's strategic move to carve out its legacy copper network into a new entity called FiberCop. Remarkably, FiberCop achieved a substantial enterprise value of €7.7 billion and attracted significant investments, including €1.8 billion from KKR, a FiberCop shareholder. These developments underscored the enduring value of legacy copper infrastructure, which could fetch substantial financial valuations from new stakeholders. These funds could then be reinvested in scaling up nationwide fibre infrastructure deployment and spreading out the peak funding requirements.

Restarting the Copper Switch-Off Program

Following the successful creation of FiberCop, TIM redirected its focus towards revitalising its copper switch-off program. As of Q3 2021, TIM successfully switched off the copper network in Trento, having deployed fibre across the entire region. This achievement was made possible through close collaboration with municipal authorities, ensuring the timely rollout of fibre infrastructure. TIM also incentivised its customers to migrate to fibre-based products by offering higher speeds and discount vouchers. Furthermore, TIM unveiled plans to roll out fibre and switch off copper networks in 95 other municipalities by 2022.

Observation

TIM's experience demonstrates the transformative power of collaboration with investors and competitors in leveraging legacy copper assets to drive fibre penetration. By monetising their legacy networks through innovative entities like FiberCop and attracting significant investments, TIM not only accelerated the rollout of fibre but also contributed to Italy's rapid progress in fibre coverage. This case study emphasises the win-win potential of such collaborations, benefiting both telecom operators and the nation by ushering in a fibre-rich future. TIM's strategic moves serve as a valuable lesson for telecom companies seeking to navigate the complex landscape of fibre deployment and copper switch-off programs.

Conclusion

The transition from copper to fibre broadband networks marks a pivotal moment in the evolution of digital connectivity. While funding challenges persist, the alignment of government initiatives with the demands of an increasingly connected world drives investment. Investor focus has evolved, pivoting towards sustainable revenue generation and customer adoption. The OPEX dilemma presents a largely untapped avenue for optimising ROI. By strategising around the switch-off of copper networks and prioritising high-quality build architecture, stakeholders can secure the long-term viability and profitability of FTTH networks, reshaping the technological landscape for generations to come.

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About the Author

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Sam Leeman, the head of PLM, Optical Connectivity at STL, brings over 20+ years of invaluable expertise to the company. With a remarkable career spanning two decades, Sam has demonstrated exceptional leadership in Product Development, Product Management, and Business Development within the telecom industry. His impressive track record includes spearheading ground breaking TCO solutions and collaborating closely with renowned telecom operators worldwide. As an influential and visionary leader, Sam plays a pivotal role in driving STL's success and shaping the future of optical connectivity.

About STL - Sterlite Technologies Ltd

STL is a leading global optical and digital solutions company providing advanced offerings to build 5G, Rural, FTTx, Enterprise, and Data Centre networks. The company, driven by its purpose of 'Transforming Billions of Lives by Connecting the World', designs and manufactures in 4 continents with customers in more than 100 countries. Telecom operators, cloud companies, citizen networks, and large enterprises recognise and rely on STL for advanced capabilities in Optical Connectivity, Global Services, and Digital and Technology solutions to build ubiquitous and future-ready digital networks. STL's business goals are driven by customer-centricity, R&D and sustainability. Championing sustainable manufacturing, the company has committed to achieve Net Zero emissions by 2030.