



Copper switch-off

A European benchmark

FTTH Council Europe conference

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Global overview

- Despite having several countries with extensive fibre coverage, **Europe has been slow to switch-off copper**
- In **Australia**, copper switch-off began in 2014 in conjunction with the deployment of the NBN, and acquisition by the NBN Co of Telstra's copper and cable network.
 - Customers in "NBN ready" areas, have 18 months notice to switch to the NBN (a mix of FTTH, FTTC and cable), before the legacy copper network is switched off.
 - As of Dec 2017, NBN Co reported that around 75% of households had connected to its network within the 18 month migration window
- In Oct 2018, Verizon announced that it would phase out copper for FTTH in parts of 6 **US** states. Customers will be migrated by a technician, with no change to voice prices and a special offer for fibre-based broadband (Fios)
- In **New Zealand**, there are plans to allow operators to start withdrawing services in "fibre-ready" areas from Jan 2020



European leaders

Estonia, Spain, Sweden

- Of the countries studied, Estonia has made the most progress towards copper switch-off
- Incumbent Telia completed the PSTN switch-off process in July 2017 (2.5 years after the programme started)
- 70% of copper exchanges were switched off at end 2018
- All ADSL connections will be switched off by end 2020 – moving to 50% fibre, 40% FTTC/G.fast and 10% fixed mobile
- Telia expects to benefit from lower fault rates and increased consumer satisfaction as well as considerable energy and space saving
- The process was facilitated by the prior PSTN switch-off (which supported ‘plug and play’ installation of new routers with POTS port for old equipment), short notice periods for exchange closure (6 months), limited reliance on copper access and one to one contact with businesses
- Spain and Sweden also have active programmes in place

Host country

Netherlands

- The Netherlands has been a pioneer in PSTN switch-off, starting its all-IP programme in 2007
- In 2016 85% of POTS customers had been migrated. KPN is aiming to achieve a complete transition to VoIP by 2019
- There is no formal programme for copper switch-off yet. However, in November 2018, KPN announced 6 pilot areas for switch-off to test the process and gain experience
- Pilots will focus on overlay areas (copper and fibre), where the majority of customers use fibre.
- There are also small pilots focused on business customers aimed at testing specific technical challenges
- Legacy equipment is a key challenge. KPN is preparing a campaign to inform residential and business customers of the consequences of migration on legacy equipment.
- In its 2018 decision, NRA ACM allowed a 1 year notice period for exchange closure if a reasonable alternative wholesale product was provided to LLU

Switch-off progress

Copper

% copper exchanges switched off

		2018	2020	2023	2030
	2015	70%	R		
Sweden	2009	42%			
Spain		2%	7.40%		
Portugal					R 75%
Italy		0%		P 60%	

Replacement technology

FTTH (50%), FTTC (40%), FWA (10%)

Fixed wireless

FTTH

FTTH

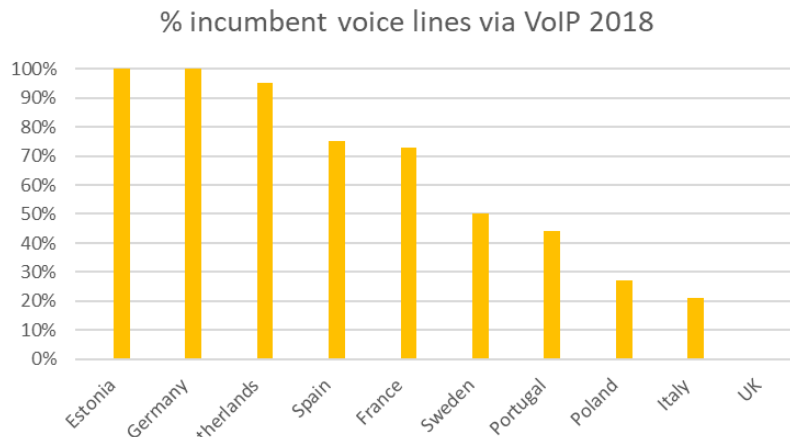
FTTC

R=regional switch-off, P=partial switch-off (feeder segment)

Source: WIK-Consult based on interviews

- Limited progress towards copper switch-off in 10 countries studied
- Estonia and Sweden are clear leaders, more gradual process Spain, Portugal
- Focus on migration to FTTC in Italy (partial switch-off)
- Pilots in NL. No concrete plans in remaining 4 countries (FR, DE, UK, PL)

Switch-off progress PSTN



Source: WIK-Consult based on interviews

- Transition to all-IP is a pre-condition for copper switch-off, but can occur independently
- PSTN switch-off has been linked to copper switch-off in IT, ES, SE,
- PSTN switch-off pursued independently of copper switch-off in UK, DE, NL, FR
- As of 2018, full transition to VoIP with PSTN switch-off had occurred in Germany and Estonia, with near full transition in the Netherlands
- In contrast, there is limited VoIP in the UK except for new build/FTTH and some business. Italy and Poland also start from a low base of VoIP lines

		% incumbent voice lines provided through VoIP													
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Estonia							100%								
Germany						50%		100%							
Netherlands	2006					85%			100%						
Portugal								44%		100%					
Spain	2009					20%		75%							
France								73%				>97%			
Poland								27%							100%
UK								0%							100%
Sweden								50%							
Italy								21%							


Source: WIK-Consult based on BEREC 2016 study and 2018 interviews



Copper switch-off

Benefits to operators (1)

- Telia, EE reports copper switch-off enabled:
 - Lower fault rates, increased satisfaction and hence lower churn
 - Considerable energy saving and space saving as Telia was able to close exchanges
- Telia, SE reports copper switch-off enabled:
 - Lower maintenance cost compared with copper
 - Dismantling of 500,000 poles (but limited savings)
 - 100 engineers to be moved from copper to fibre in 10 years



Copper switch-off

Benefits to operators (2)

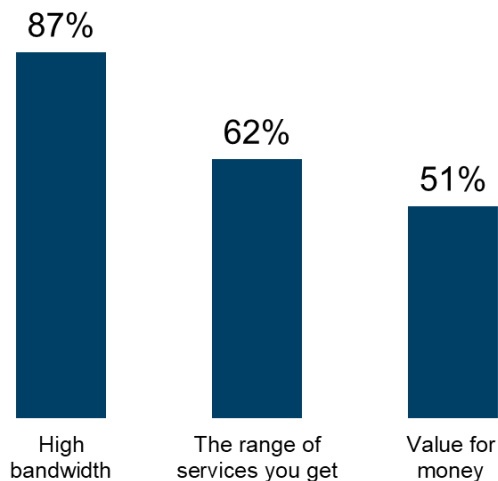
- Telefonica, ES reports that significant cost savings and efficiencies are possible from copper switch-off
 - A fibre PoP covers the equivalent of 4 copper switches
 - Access technology equipment for fibre occupies 15% of the space occupied by copper; and
 - Copper switch-off saves 60% energy cost
- Verizon, US: “fibre is overall 60% cheaper compared to copper”
 - Real estate 60-80% savings
 - Energy 40-60% savings
 - Reliability; fibre is 70-80% more reliable than copper. 60% fewer costly truckrolls and savings of 40-60% on maintenance

Copper switch-off

Benefits to customers (1)

- In a 2017 representative survey of consumers in the fibre-rich Swedish market, WIK found that 82% of FTTH customers were happy with their service compared with only around 50% of DSL customers
- 87% of FTTH users highlighted high bandwidth as a benefit of FTTH
- The range of services and value for money were also cited

Swedish consumers: perceived benefits of fibre



Copper switch-off

Benefits to customers (2)

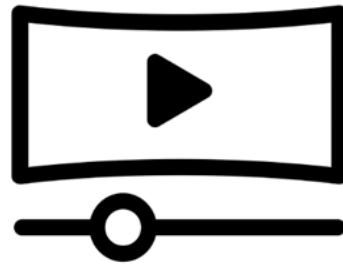
Information

+ 7%



Entertainment

+ 15%



Social interaction

+ 15%




Local services

+ 10%




- FTTH users in Sweden were more likely to be online daily, and were more active on the Internet than users in Germany
- More than 30% of Swedes surveyed streamed all their music and video content online




Copper switch-off Enablers & incentives

- Copper switch-off requires the ability and incentive to switch by the incumbent, challenger operators and customers
 - Installation of FTTH incumbent and/or willingness by incumbent to use competing FTTH infrastructure
 - Availability of FTTH access for access seekers and a willingness to migrate, or own FTTH (co-)investment
 - Understanding of benefits of FTTH, willingness, and ability of residential and business customers to migrate
- Incentives for operators and consumers to migrate can in turn be influenced by regulatory approaches to access regulation and pricing, migration and advertising standards



Copper switch-off Regulatory barriers

- Switch-off also necessitates the removal of legal and regulatory barriers which might unduly delay or prevent switch-off
- Examples of regulatory conditions which could impede migration from copper to fibre amongst otherwise willing parties include
 - Unduly restrictive conditions for closing copper exchanges or shutting down PSTN such as long notice periods and/or onerous wholesaling requirements
 - Obligations to continue to supply copper-based/analogue wholesale products (through the market analysis) or retail products (through USO conditions)
 - Obligations for line powering to ensure service continuity in the event of a power cut



Copper switch-off

Overview of barriers

- The leading country for copper switch-off to FTTH (Estonia) benefits from incumbent FTTH deployment, absence of regulatory barriers and limited wholesale copper reliance
- The gradual pace of incumbent FTTH deployment and reliance on copper upgrade technologies is a core factor delaying switch-off in UK, DE and IT
- Strict conditions or a lack of precise guidance on conditions for exchange closure could be factors in PT and FR. No rules on exchange closure have yet been set in the UK
- The reluctance of customers may be hampering switch-off in FR, PL. This was managed in EE through “plug and play” equipment and support for legacy equipment
- Transitioning of critical legacy equipment continues to be a concern in SE, PL, UK, NL
- Copper access obligations such as WLR persist in the UK
- Line powering obligations were a barrier to switch-off in some countries, but this issue has now been addressed in all the countries studied



Copper switch-off

Encouraging consumers

- Voluntary migration by customers from copper to fibre is influenced by the relative pricing of the products in relation to their perceived value
- The perceived value is in turn affected by how broadband is marketed to customers and how they are made aware of the difference between copper, partial fibre, and full fibre
- Customers also need to be able to switch easily from a practical perspective. This includes switching platforms, when fibre is deployed by alternative operators
- Customers may be deterred from switching by the need for a site visit or requirements to replace their legacy equipment. Solutions which provide a “plug and play” option for consumers and support legacy equipment eg EE could help alleviate these concerns.
- As legacy equipment issues are related to the move from PSTN to IP – pursuing PSTN switch-off could also be a helpful precursor to copper switch-off

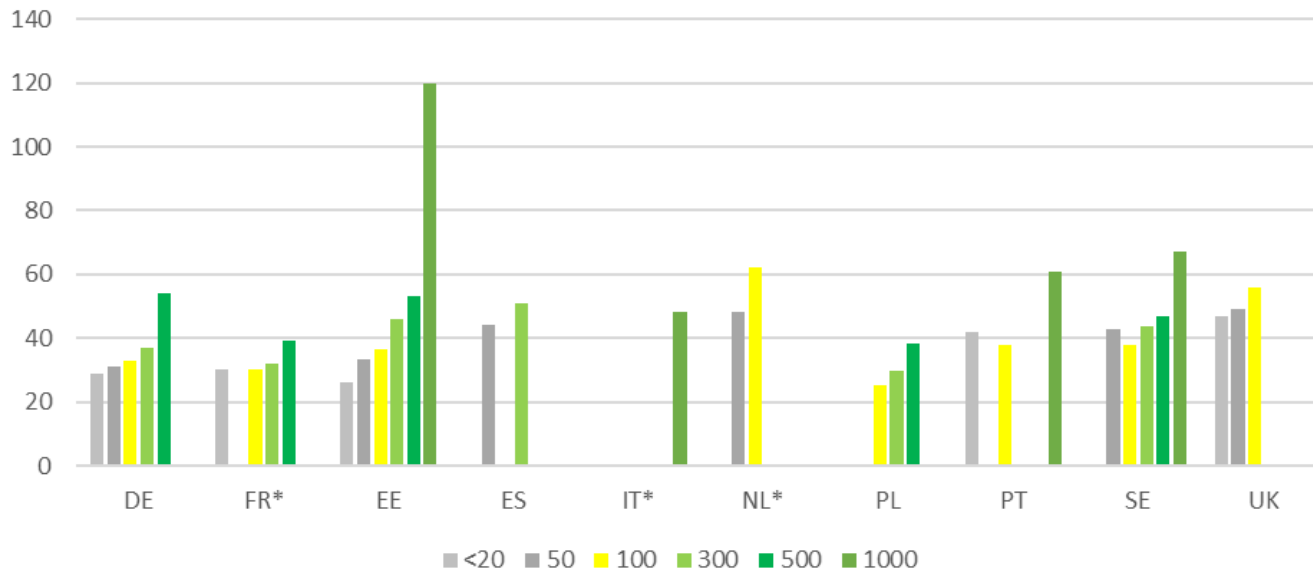
Copper switch-off

Relative retail prices

Source: Broadband Internet Access Cost 2017 study for the European Commission

*Triple play offers

Broadband + telephony incumbent offers, total cost/month with telephone line rental € PPP Autumn 2017



- Similar retail prices can spur voluntary migration for consumers
- FTTH-based services are priced at a small or no premium in countries such as SE, FR
- In countries such as ES and PT, copper is no longer actively marketed by incumbents
- FTTH limited in UK, DE – pricing encourages migration to FTTC

Conclusions

- Switching from copper to FTTH delivers benefits to both consumers and operators and improves the business case for FTTH
- There is limited progress towards copper switch-off in Europe
- From the countries studied, only EE has made major steps to switch customers from copper to FTTH, while switch-off from copper to wireless has progressed in SE
- More progress has been made towards PSTN switch-off (a prerequisite for copper switch-off). PT, EE, NL and DE should achieve all-IP by 2020, but other countries such as FR, PL and UK are not set to achieve all-IP until 2025
- The reasons for the limited switch-off plans are diverse. In some countries FTTH has yet to be widely deployed. In others strict controls on exchange closure may be delaying switch-off. A lack of understanding of the benefits of fibre and challenges in switching to a fibre operator may also be hampering consumers from migrating in other cases.

Recommendations

- Member states and regulators could usefully act to enable copper and PSTN switch-off, and support consumer migration to FTTH
- Key steps are:
 1. Incentivise FTTH deployment and/or use of FTTH access by incumbents and avoid promoting continued reliance on copper and copper upgrades such as FTTC
 2. Facilitate PSTN switch-off as a precursor inter alia by encouraging operators to find solutions that support legacy equipment or inform consumers of alternatives
 3. Review conditions (notice periods and wholesale obligations) for copper exchange closure
 4. Improve customer awareness by clearly distinguishing FTTH from FTTC in advertising
 5. Improve processes for switching between the incumbent and alternative FTTH platforms



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