Network transformation outlook 2022-2027

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Sensitivity **Unrestricted**

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1. Background and Scope of the present document

This document is an update of the document "Network transformation outlook 2021-2026" and has been elaborated to answer the request for information of the BIPT as formulated in "het besluit van de conferentie van regulatoren voor de elektronische communicatiesector van 29 juni 2018 met betrekking tot de analyse van de markten voor breedband en televisieomroep" and in "het besluit van de Raad van het BIPT van 13 december 2019 met betrekking tot de analyse van de markt voor hoogwaardige toegang".

The present document has been constituted to Proximus' best knowledge at present of the future evolutions of its fixed networks taken into account that several matters discussed in the present document are not covered by detailed or final decisions of the management and/or Board of Directors.

The present document contains the relevant information to what transformations in Proximus' fixed network will take place in the coming 5 years that will or might have an impact on the existing wholesale services and wholesale access points.

Most statements in the present document constitute forward-looking statements. These statements may include, without limitation, statements concerning future technological evolutions, decisions and timelines, and statements preceded by, followed by or including the words "believes", "expects", "anticipates" or similar expressions. These forward-looking statements rely on a number of assumptions concerning future events and evolutions and are subject to uncertainties and other factors, many of which are outside our control that could cause actual evolutions to differ materially from such statements.

Data and information in the present document may be subject to re-evaluation, evolution and changes. Proximus cannot guarantee that this information is complete or that no new information will become available with an impact in the coming 5 years.

Proximus cannot be held liable for any mistake, omission or any other short coming of the present information, which has been provided based on our best knowledge and in good faith.

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This document and the information within are made independently of any form of appeal, present and future, against a decision or a regulatory requirement imposed to Proximus.

2. The Proximus Mantra(+) program

Proximus' Mantra(+) program, in this document referred to as "Mantra" and "Mantra+", aims at adapting and transforming the fixed network of Proximus to the global technological evolution:

- Evolution of the Fixed Voice network and Voice Service Platforms.
- Evolution of network technologies (ATM/SDH, Ethernet) and anticipation of the end of life of multiple legacy technologies.
- Invest in network simplification to reduce OPEX and increase operational efficiency.

The Mantra network transformation process is being carried out in two phases:

- The first phase concerned the building of an MPLS & IP-based network and the porting/implementation of the Proximus product portfolio (retail and wholesale) on this infrastructure.
- In the second phase, the legacy network technologies are subject to consolidation and phasing out in view of optimizing the network infrastructure and deal with the fact that legacy technologies have become obsolete and without vendor support.

The first phase has been finalized. In line with our present expectations, the second phase includes all initiatives aimed at consolidating the customer installed base on the MPLS & IP infrastructure and at reducing the operational complexity of managing several network infrastructures in parallel (one per service).

- Phasing out of remaining access legacy technologies (Leased Lines >=2 Mbps & SDH) and traffic transition to the MPLS & IP-based infrastructure.
- Phasing out of remaining core legacy technologies (SDH, PSTN, ISDN, …) and traffic transition to the MPLS & IP-based infrastructure.

The Mantra program has impact on the Wholesale services currently offered by Proximus. Below we summarize the most important impacts still to come:

- Data and Capacity services: migration from Leased Lines >=2 Mbps to Ethernet based services.
- Voice Interconnect: as the complete voice network (except remaining legacy ISDN-BAs) has now been migrated to an IMS based infrastructure, the current TDM interconnection model between Proximus and third-party operators is evolving to an IP Interconnect model.
- Local Loop Unbundling services: as additional LEX buildings will be closed, the colocation and services delivered in and from these buildings will have to be terminated and/or migrated to alternative offers.

The Mantra(+) program has a different impact on each of the wholesale customers. In that perspective, Proximus holds, since 2010, recurrent meetings with the wholesale customers in order to:

- Inform the wholesale customers about the products that will be out-phased and about the future products.
- Give them guidance on possibilities for evolution scenarios.
- Discuss with them the lists of impacted lines and create migration plans for these.

The long-term ambition of Proximus is to cover the centre of cities and communes with fiber (see chapter 3), to make in the non-fiberized areas great parts of the copper (feeder) network redundant and to further dispose parts of the total technical surface area mainly located in smaller buildings from mid-2019 onwards. This resulted in the decision to start the related works for "Mantra+" from 2017 onwards with a pilot of 10 buildings, for which the outphasing has been finalized, and the notification of 64 Mantra+ buildings (which is now reduced to 27 buildings still to be outphased - see chapter 6). At that stage, the technology will be located mainly in existing street cabinets, supplemented with newly designed small containers called Optimus containers. Some local nets will not be equipped with an Optimus container but with an OVD (Optische Verdeler), a passive street cabinet that patches the optical fibers to 1 or more neighbouring LEXes. At the beginning of 2022, Proximus decided to outphase also some of its LDCs (referred to as the Lotus Program) (see further in Section 6 on Building Outphasing). In 2022, 33 LDCs have been outphased. The goal is to outphase about 5 LDC's in 2023, about 97 in 2024 and about 35 in 2025.

3. Broadband Access Evolution

Preliminary statements in this chapter concern the technologies and services in general in Belgium. Specific circumstances may exist in outphased buildings as described in Chapter 6.

Proximus continues to deploy Fibre-to-the-Curb in selected areas allowing to extend the VDSL2 service coverage.

The impact of this evolution on wholesale access services is twofold:

1. The LEX based unbundling model becomes obsolete (which is confirmed by the fact that certain MDF sites are already closed down or are notified for closure).
2. ADSL(2+) is gradually being outphased in the copper distribution areas served by ROPs with all Living Units connectable in VDSL2 as an enabler to activate vectoring also in the downstream frequency bands between 552 kHz and 2,2 MHz. The opening of the VDSL2 zones 6 and 7 triggered a list of additional homogenizable ROPs.

3.1 VDSL2 network evolution

VDSL2 coverage

Proximus announced its Broadway plans publicly in 2004 with an initial target coverage for VDSL2 of 46%. This coverage target was progressively increased, so that Proximus has reached by end 2022 an effective service coverage for VDSL2 of 96,6%([1]).

Information on a more detailed basis regarding availability is provided if, where and to the extent relevant in the context of the existing wholesale access services.

The coverage as well as the attainable speeds with VDSL2 depend on attenuation and distance. For the current attenuation- and distance limits, please refer to the Bitstream xDSL offer published on Proximus' web site.

Since 2010, the VDSL2 network has evolved significantly, among others with the introduction of DLM, vectoring, extension of VDSL2 zones, increase of down- and upstream speeds etc. and is still evolving.

From mid-2020 onwards, most newly installed ROPs (mainly in white zones) are equipped with new DSLAM equipment (7363 MX-6). This new equipment contains a new line card, i.e. the RDLT-G card of Nokia and consolidates all DSLAM functionalities (logic, processing, management functionalities) completely in the ROP. It will also support the future 35Mhz technology (see below). The introduction of this new DSLAM equipment is considered as a major network upgrade with the associated implications on OLO CPE operators' roles and responsibilities. The gradual volume mass migration of the current DSLAM

[1] The current VDSL2 provisioning speeds range from 70 Mbps (vectoring zone 1) downstream to 8 Mbps (vectoring zone 7) and can increase through the DLM-process from up to 16,5 Mbps (in legacy zones 4 and 5), 30 Mbps in vectoring zones 6 & 7 to up to 100 Mbps (in vectoring zone 1).

equipment in the existing ROPs, implying a short service interruption, will most likely not start in 2023 since the main investment fixed access priority is FTTH. The planning of these volume mass migrations will depend on the renewal needs of the current VDSL2 platform and the need for bit rates above the current 17 MHz potential, taking into account the FTTH roll-out (to avoid double investments). Once the planning is stable, the volumes will be communicated timely. Such migrations have already taken place in a small scale in the course of 2022 to further finetune the IT deliveries, the logistics and the migration processes of the new DSLAM equipment. The coming years such small scale migrations will continue for tactical reasons (deploy the 2 x MX-6 solution to solve ROP saturations or to solve fiber saturations as the MX-6 solution consumes less fiber than the existing SBREM vectoring solution) and for IT regression test purposes.

Proximus is further upgrading its VDSL2 network by gradually starting the commercial activation of vectoring from LEX and LDC in up to about 200 LEXes and LDCs. In the course of 2022, vectoring has been deployed in 54 LEXes and Proximus has planned to deploy vectoring in roughly an additional 50 LEXes and LDCs in 2023. This increases the bandwidth to the end-users that are connected to a LEX or LDC and allows Proximus to replace in the concerned locations the old NVLT-D line card, as the latter does not support vectoring. Note that this maximum potential of up to about 200 LEXes and LDCs excludes LEXes and LDCs that are in scope of the planned FTTH footprint or in the scope of Mantra+ and Lotus.

In addition, Proximus could implement solutions to further upgrade its VDSL2 network. In this respect, the following solutions are considered :

- Solutions that do not require the new MX-6 technology:
    - Increased broadband internet speeds for relatively long vectored lines on non homogenized ROPs.
    - Improve the provisioning profile of certain lines.
    - Potentially revise the provisioning rules (attenuation and distance rules). The feasibility of this is currently under assessment.

- Solutions that require the new MX-6 technology and 35 MHz / LR VDSL2 capable CPE :
    - VDSL2 35 MHz which has been tested with field trials, to further increase downstream speed through the use of the spectrum to 35 MHz. VDSL2 35 MHz would be enabled on the new VDSL2 platform as described above. The commercial activation of 35 MHz bitrates on MX-6 sites by end 2023 (respecting the regulatory lead times) is not excluded, but unlikely due to the relatively low current footprint of ROPs with MX-6 technology. However, a technical 35 MHz activation pilot will start in 2023, without immediate impact on the services. Once the commercial activation is decided, it is considered as a major network upgrade. Proximus will then timely adapt the Bitstream xDSL reference offer, the UNI specification as well as the OLO-CPE test plan in order to make sure that alternative operators can also benefit from this new 35 MHz VDSL2 technology when launched. Operators using an existing OLO-CPE that may be 35 MHz compatible will have to recertify these CPEs conform the OLO-CPE test plan (that will be updated for 35 MHz VDSL2). It is important to note that the existing 17,6 MHz capable CPEs are expected to still function in 17,6 MHz VDSL2 profiles with the new MX-6 platform.

- "Long Reach" VDSL2: the potential of this standard has been technically assessed, but no further steps are planned.

3.2 Physical Access Network Evolution

As Proximus deployed a fibre network to the vicinity of the Street Cabinet (KVD, Borne), by installing Remote Optical Platform units (ROPs) next to those Street Cabinets from which broadband- and voice services are provided, the MDF functionality in the Local Exchange (LEX) will be lesser and lesser used.

Therefore, as part of its roll-out, Proximus is able to dismantle a number of the local exchange buildings. Hence the current colocation and unbundling services at the LEX will be terminated or largely reduced, pursuant the regulatory framework as defined in the relevant regulated reference offers and the respective contracts.

In order to support the long-term target of the disappearance of the MDF functionality in the Local Exchange building (LEX), Proximus might reduce renewal investments in the copper feeder network by gradually outphasing copper feeder cables if and where they must be renewed (e.g. triggered by roadworks or cable damage).

The figure below gives an overview of the most important elements in the new access network, as well as the respective elements.

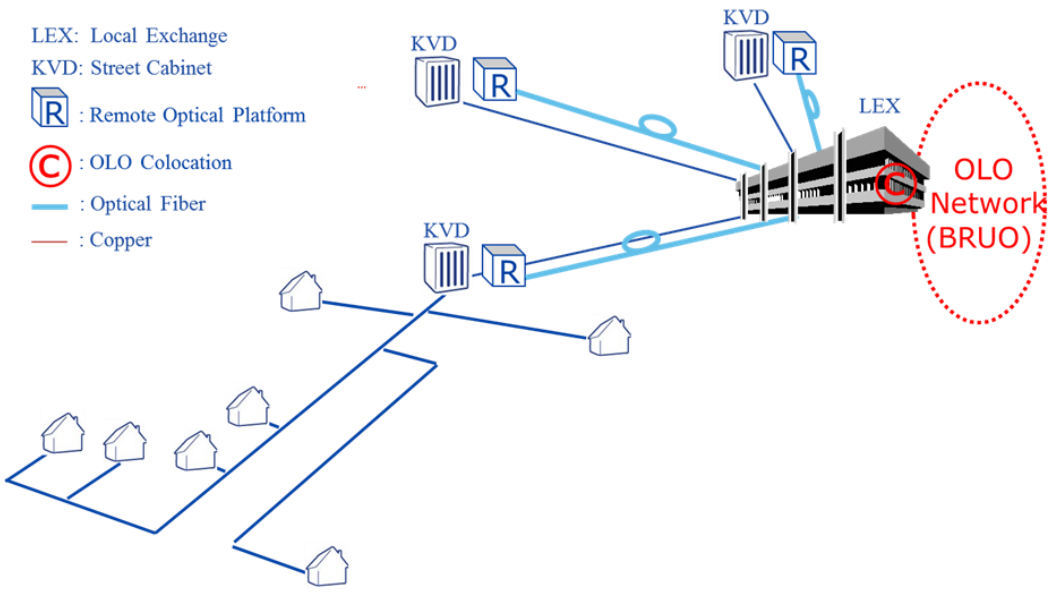

Figure 1: Physical Access Network Evolution

3.3 Wholesale Broadband VDSL2

The Bitstream VDSL2 service allows the alternative player to connect its end-users onto the Proximus network at a Proximus Service PoP using VDSL2 technology. The end-to-end transport between the end-user and the beneficiary is based on Ethernet.

Impacts of the vectoring technology on the Bitstream VDSL2service

The application of vectoring on the VDSL2 lines is not compatible with the delivery of ISDN services on VDSL2 lines. As a result, since 2013:

- Ordering of new Bitstream VDSL2 products on end-user lines with ISDN service is not possible anymore. Ordering Bitstream VDSL2 on another pair will remain possible: Bitstream VDSL2 without Voice or Bitstream VDSL2 with Voice on PSTN.

- Proximus finished the uncoupling of all existing configurations where both Bitstream VDSL2 and an ISDN service were offered on the same copper pair. The ISDN service is moved on another pair, without impact on the Bitstream VDSL2 service of the end-user.

(Please refer to the Bitstream VDSL2 offer for further details)

The extension of vectoring on VDSL2 lines in the frequency bands between 552 kHz and 2,2 MHz is not compatible with the delivery of ADSL1 and ADSL2+ services from those ROPs. As a result, from 01/07/2017 for ADSL2+ and from 01/02/2018 for ADSL1 :

- Ordering of new ADSL1 or ADSL2+ products is not possible anymore for endpoints which are located in copper distribution areas in which all Living Units can be connected in VDSL2.

Reach Extended ADSL2 services are opened on all ROPs which support “ADSL from ROP” or which have been homogenized (meaning sub 2,2 MHz vectoring has been activated).

The speed of VDSL2 lines which are not equipped with a VDSL2 CPE which is at least “vector-friendly” at the moment of the activation of vectoring on the ROP concerned will be reduced to a Fall-back speed as defined in the Bitstream VDSL2 reference offer.

The Ethernet backbone investments project (introduced in chapter 2) - which aims at gradually replacing the current Ethernet aggregation/core networks - added a third option called “Single VLAN” to the current Bitstream VDSL2 and Bitstream Fiber GPON reference offers on top of the existing options “Shared VLAN” and “Dedicated VLAN”. No plans to outphase these existing options have been developed yet.

3.4 Fiber To The Home

At the end of 2016, Proximus announced an investment of € 3 billion in the coming 10 years to accelerate the roll-out of Fiber in Belgium aiming at covering the centres of cities and communes, through deployment both on the façade of buildings and in certain sections in underground ducts.

In 2021, Proximus also set up a cooperation/co-investment with other partners for fiber roll-out, via 2 joint ventures: Fiberklaar in Flanders and Unifiber in Wallonia. The objective is to have 4.2 million homes and companies connected to fiber by end of 2028, representing a coverage of at least 70% of Belgium.

In 2022 Proximus participated in a cooperation in the German Speaking Community to roll-out a FTTH network on the territory of the Community.

In June 2022, Proximus announced a partnership with a Consortium of Belgian financial partners with the intention to bring fiber up to an additional 1.7 million homes and businesses situated in areas with low population density. This deployment would come on top of existing roll-out plans of Proximus and its joint ventures and allow to extend fiber coverage to 95% of all Belgian homes and businesses by 2032. This will permit to bring 10 Gigabit PON technology both in dense and more rural areas and is an important step in Proximus' ambition to ultimately offer a Gigabit network for the whole territory.

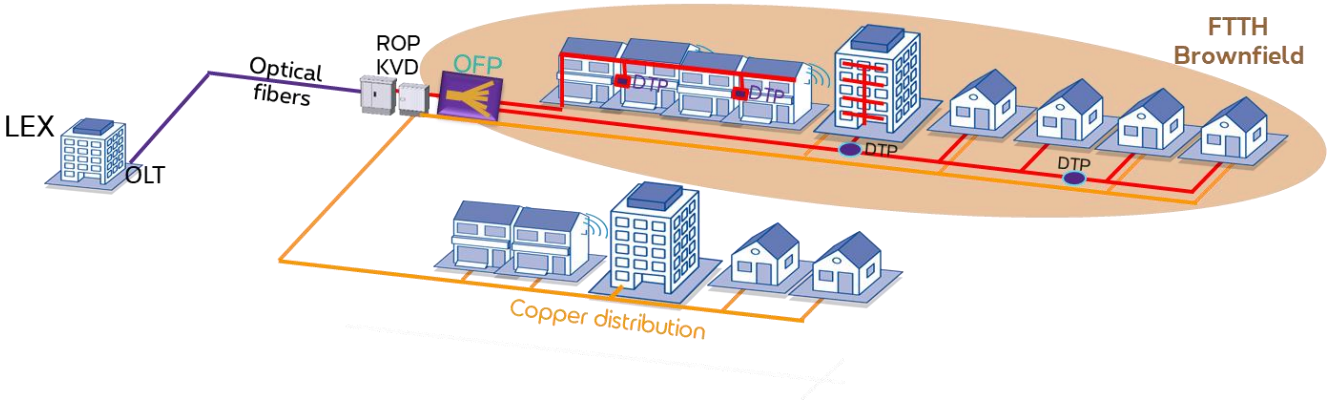

Figure 2: FTTH network

In the coming years, Proximus will fully fiberize dense and medium-dense city areas, starting with a progressive roll-out. An overview of all cities where fiber roll-out is started or announced to be started can be found on:

https://www.proximus.be/en/id_cr_fiber_cities/personal/orphans/fiber-to-your-home/the-future-comes-to-your-city.html

In such areas, migrations from copper to fiber will take place progressively following the full fiber coverage of the relevant geographic areas which will be notified for the copper plant outphasing (see also Chapter 7). Proximus also continues to deploy FTTH in industrial zonings and in new residential zonings.

In 2014, Proximus presented its first commercial wholesale FTTH offer. In November 2018, a Bitstream Fiber GPON offer was presented in line with the Broadband market decision of 29 June 2018.

Proximus notifies its wholesale fiber customers and the BIPT on the planned network extensions of the fiber deployment progressively along the project:

- Twice a year, Proximus communicates the Fiberhoods for which the construction started to the BIPT and the wholesale customers.
- A stop service of all copper based services in these Fiberhoods is communicated to the BIPT and the wholesale customers conform the timings as defined by the BIPT. An overview of all Fiberhoods for which copper outphasing is planned can be found in Chapter 7.

With the exception of high-speed digital services such as LAN Extension Solutions (BLES), Optical Network Services (ONS) and a set of bitstream services, only IP-based services will remain available in FTTH areas.

After an initial introdcution in 2022, Proximus intends to launch XGS-PON (10Gbps) across the complete PON network in the course of 2023.

On 25 May 2021, Proximus demonstrated as the first operator in the world the capabilities and the performance of Nokia's 25G-PON technology in a live network (in Antwerp). Deployment of this technology in the PON network is not yet planned and will be market driven.

4. Data and Capacity Services

Preliminary, statements in this chapter concern the technologies and services in general in Belgium. Specific scenarios may exist in outphased buildings as described in chapter 6.

Bandwidth demand is ever increasing in today's data networks and these same networks are evolving more and more towards Ethernet. Therefore, in the long term, Proximus anticipates the Leased Lines services based on SDH to become obsolete, as data needs will be fulfilled by another type of supply, which forms part of a different market for data services.

The following actions are still to be finalized in order to complete the SDH outphasing:

- Higher or equal to 2 Mbps Leased Lines, including partial circuits, backhaul and half links, are no longer sold since 31 December 2020 ("Stop sell")[2] with a progressive "Stop service" afterwards. All these lines will have to be outphased by end 2023 as a prerequisite for SDH outphasing.
- Ethernet services (10 Mbps) and Fast Ethernet services (100 Mbps) are currently implemented on top of the SDH-network which is planned to be outphased. Fast Ethernet services (100 Mbps) can be implemented on the Ethernet backbone but the 10 Mbps Ethernet services are no longer sold since 31 December 2020 and have to be outphased by end 2023 as a prerequisite for the SDH-outphasing.
- Ethernet over copper (EFM) is not a future proof technology. Today there are however no concrete plans to outphase this technology in the coming years.

[2] Except for TDM voice interconnect, see chapter 5.

5. Voice Interconnect Evolution

A stop service for the remaining legacy ISDN-BA lines on S12 is foreseen end of June 2023. For ISDN-PRA's still using the SDH network, a stop service is foreseen on 31 December 2023.

Proximus completely stopped the CS and CPS services at 16 January 2023 after preliminary communication to the remaining CPS/CS operators.

A gradual migration towards voice over broadband services will further reduce the use of PSTN services emulated via Access Gateway (AGW) and the long term replacement strategy of the Access Gateway requires forced migrations of remaining PSTN services as from 2020.

The TDM interconnection model between Proximus and third party operators is evolving to an IP Interconnect model. The migration from TDM to IP interconnection started in 2018 aiming at closing the TDM interconnection afterwards. Proximus foresees to have the fixed and mobile TDM interconnection service provision outphased after handling the migration of existing TDM interconnections to VoIP interconnection in order to enable the SDH outphasing by the end of 2023.

Proximus notified the end of the fixed and mobile TDM interconnection offers to BIPT on December 24th, 2021. Proximus proposed to end both TDM offers by April 1st, 2022 and the end of the TDM service provision at the latest by end of 2023.

As from April 1st, 2022 Proximus offers for new requests only a VoIP based interconnection to its fixed and mobile network.

6. Building Outphasing

The Building Outphasing is an essential component of the Proximus Mantra and Mantra+ Programs. **A list of 65 Mantra buildings was initially identified** for closure between 2012 and 2021, and communicated to the market. In this initial plan, some large buildings were excluded, due to their technical complexity. The building outphasing plan has evolved to a lower number of buildings, but puts more focus on the large buildings. 22 Mantra buildings have been outphased until now.

With regards to the Mantra+ Program, 74 local nets (including 10 pilot nets) were initially identified for which the main building would be emptied, of which 25 have been executed in the meantime. Due to the acceleration of the fiber roll-out as announced by Proximus in 2020 (cfr. supra), the Mantra+ planning has been updated significantly and reduced to 27 buildings still planned to be outphased until 2025.

With regards to the Lotus Program, 33 LDCs have been outphased in 2022. The goal is to outphase an additional number of 5 LDCs in 2023, 97 in 2024 and about 35 in 2025. Note that the impact of the outphasing of these LDCs on the alternative operators is very limited: only Bitstream xDSL lines are connected to these buildings, and these will be migrated to ROPs in the neighbourhood of the LDC. The table 1 below summarizes the current building outphasing planning of the "Mantra+" program in the period 2022-2025. Note that this list also contains buildings or copper MDFs that have to be outphased due to external factors (02BMO, 02BTR, 02BRA and 91WON). The table 2 summarizes the building outphasing planning in the framework of the Lotus program for the year 2023. **These plannings are only indicative and still subject to changes**.

Table 1: building outphasing planning of the Mantra/Mantra+ program

End of Service Delivery	Local Net	Phase Out Year	Address, Nr	City
31/12/2022	91WON[3]	2022	Zeeschipstraat, 209	WONDELGEM
30/06/2023	91ZOT0	2023	Meerlaan 54	ZOTTEGEM
30/06/2023	82DIN0	2023	Rue Bribosia, 9	DINANT
30/06/2023	64LAL0	2023	Rue de la Concorde, 17	LA LOUVIERE
30/06/2023	58KOK0	2023	Koninklijke Baan 81	KOKSIJDE
30/06/2023	16RIL0	2023	Diestsesteenweg, 259	RILLAAR
30/06/2023	89NEE0	2023	Kanaalstraat, 7	NEEROETEREN

[3] Only MDF outphasing, no building outphasing.

End of Service Delivery	Local Net	Phase Out Year	Address, Nr	City
30/06/2023	60COU0	2023	Avenue de la Libération, 21	COUVIN
30/06/2023	84MAR	2023	Rue des Brasseurs, 8	MARCHE-EN-FAMENNE
30/06/2024	41ENG0	2024	Rue Maréchal Foch, 2	ENGIS
30/06/2024	03MEE0	2024	Meerlesesweg, 57	MEER
30/06/2024	15PUT0	2024	Pachtersdreef, 24A	PUTTE
30/06/2024	11ALK0	2024	Stationsstraat, 126	ALKEN
30/06/2024	14BAL0	2024	Rijsberg, 39	BALEN
30/06/2024	65JUR0	2024	Rue du Moustier	JURBISE
30/06/2024	71FOS0	2024	Rue des Remparts, 5	FOSSES-LA-VILLE
30/06/2025	03KON0	2025	De Villermonstraat 15 - 17	KONTICH
30/06/2025	10BEA0	2025	Route de Beauvechain, 27	BEAUVECHAIN
30/06/2025	11HEU0	2025	Pastoor Paquaylaan, 131	HEUSDEN
30/06/2025	14OTU0	2025	Steenweg op Mol, 152	OUD-TURNHOUT
30/06/2025	15WEE0	2025	Vredeslaan, 82	WEERDE
30/06/2025	41MIC0	2025	Rue de la Paix, 29	MICHEROUX
30/06/2025	52WAA0	2025	Dommelstraat	WAASMUNSTER
30/06/2025	59OUD0	2025	Kasteeldreef, 2c	OUDENBURG
30/06/2025	71SOL0	2025	Rue Emile Vandervelde, 2A	SOLRE-SUR-SAMBRE
30/06/2025	80VIE0	2025	Rue de l'hôtel de Ville	VIELSALM
30/06/2025	89LNK0	2025	Dorpstraat, 20	LANKLAAR

Table 2: building outphasing planning of the Lotus program

End of Service Delivery	Local Net	LDC name	Phase Out Year	Address, Nr	City
2023	03KON0	03KSL	2023	Scheihagenstraat, 32	Kontich
2023	03HOO0	03MIL	2023	Dorp, 42	Minderhout
2023	52BUG0	52MAR	2023	Jan Hammeneckerstraat, 121	Mariekerke (Bornem)
2023	50MOE0	50PMO	2023	Lambrecht Bovijnstraat 27	Moerkerke
2023	91ZOT0	91ELL	2023	Molenbeekstraat, 8+	Elene

Note that those dates are end of services delivery dates for **all** lines; which of course requires a progressive migration to get them all migrated in due time. Building outphasing automatically implies that the outphasing of legacy ISDN lines is performed simultaneously or beforehand. No services need to be migrated to an alternative solution in the framework of the Lotus program.

The following services will have to be migrated to alternative solutions before the end of service delivery date of the outphased building where they are currently in service:

Table 3: Services to be migrated to alternative solutions.

Product type
Co-location and co-mingling in current buildings
Explore EFM (or E-line EFM or NGLL EFM)
BRUO (RC and SP) (a)
Leased Lines equal to or greater than 2 Mbps
ONS 10 Mbps

(a) Not applicable in copper zones for OLOs with a valid contract for co-mingling in the new Atropos room.

As mentioned in different chapters higher in this document, certain Product types are or will be the subject of a global outphasing with "Stop service" dates that might precede notified "end of service delivery dates" of outphased buildings.

In order to avoid newly installed services to be migrated shortly later, Proximus sends yearly to each Wholesale customer a notice of "**Stop sell**" pursuant to the information delays contractually specified. Similarly, for each outphased building, Proximus will send to each Wholesale customer present in the

concerned local net a **notice of service suspension** ("Stop Service") pursuant to the information delays contractually specified for each impacted service, as well as a list of circuits impacted and of possible service alternatives.

7. Copper outphasing

Proximus' goal is to fully outphase the copper network (feeding and distribution) in the areas (fiberhoods) where FTTH is deployed in both its own footprint and the footprint of the Joint Ventures. **All services provisioned on copper** will have to be migrated to alternative solutions (cfr. table 4) before the end of service delivery date of the fiberhood where they are currently in service.

The table 5 summarizes the current copper outphasing planning until mid 2025 as officially notified to the market. **This planning is only indicative and still subject to changes**[4]. Operators that signed a GPON NDA can obtain on request the preliminary copper outphasing planning for all fiberhoods where the fiber roll-out started but for which copper outphasing is not notified yet.

Note that at this stage, no copper outphasing is foreseen in FTTB[5] zones.

Table 4: Services to be migrated to alternative solutions mainly include:

Product type
Explore EFM (or E-line EFM or NGLL EFM)
BROTSoLL Leased lines on Copper
Commercial Leased Lines on Copper
BRUO (RC and SP)
All commercial xDSL based services
All Bitstream xDSL based services
PSTN on AGW
Legacy ISDN BA ([a])
Legacy ISDN-30

([a]) A "Stop Service" by 30/06/2023 is planned for legacy ISDN-2 subscriber lines.

[4] Roadworks in parts of a planned Fiberhood might for example lead to an accelerated copper outphasing in the impacted parts of the concerned Fiberhood.

[5] FTTB = Fiber to the Business: industrial zones and buildings with a high concentration of business customers.

Table 5: Copper outphasing planning

End of Service Delivery	Fiberhood
31/12/2023	W02-D-Diamant-FH01
31/12/2023	W02-D-Hasselt-FH03
30/06/2023	W01-C-Gent-FH06
30/06/2023	W01-C-Gent-FH09
30/06/2023	W01-C-Gent-FH11
30/06/2023	W02-D-Liege-FH01
31/12/2023	W01-C-Deurne-FH06
31/12/2023	W01-C-Deurne-FH07
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31/12/2023	W01-C-Charleroi-FH04
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31/12/2023	W01-C-Namur-FH07
31/12/2023	W02-D-Liege-FH03
31/12/2023	W02-D-Hasselt-FH01
30/06/2024	W01-C-Deurne-FH10
30/06/2024	W01-C-Deurne-FH11
30/06/2024	W01-C-Gent-FH14
30/06/2024	W01-C-Gent-FH15
30/06/2024	W01-C-Roeselare-FH05
30/06/2024	W02-D-Evere-FH01
30/06/2024	W02-D-Leuven-FH01
30/06/2024	W03-C-Liege-FH04
30/06/2024	W03-C-Aalst-FH01
31/12/2024	W01-C-Gent-FH05
31/12/2024	W03-C-Aalst-FH02
31/12/2024	W03-D-Mechelen-FH01
31/12/2024	W02-D-Leuven-FH03
31/12/2024	W02-D-Evere-FH02
31/12/2024	W03-C-Charleroi-FH10
31/01/2025	W01-C-Gent-FH17
31/01/2025	W03-C-Koekelberg-FH01
31/01/2025	W03-C-Koekelberg-FH02
31/01/2025	W04-C-Evere-FH05
31/01/2025	W01-C-Namur-FH03

31/01/2025	W03-C-Liege-FH07
28/02/2025	W03-D-Kortrijk-FH01
28/02/2025	W02-D-Hasselt-FH07
28/02/2025	W03-D-Hasselt-FH04
28/02/2025	W01-C-Deurne-FH12
28/02/2025	W03-C-Vilvoorde-FH04
28/02/2025	W03-C-Vilvoorde-FH03
28/02/2025	W03-C-Schaerbeek-FH04
28/02/2025	W03-C-Anderlecht-FH05
28/02/2025	W03-C-Anderlecht-FH06
28/02/2025	W01-C-Namur-FH04
31/03/2025	W01-C-Gent-FH16
31/03/2025	W03-C-Antwerpen-Oost-FH21
31/03/2025	W01-C-Deurne-FH13
31/03/2025	W02-D-Uccle-FH01
31/03/2025	W03-C-Uccle-FH03
31/03/2025	W03-C-Ixelles-FH14
31/03/2025	W01-C-Charleroi-FH02
31/03/2025	W03-C-Liege-FH06
31/03/2025	W03-C-Liege-FH05
30/04/2025	W02-D-Hasselt-FH02
30/04/2025	W03-C-Knokke-Heist-FH01
30/04/2025	W01-C-Deurne-FH14
30/04/2025	W03-D-Mechelen-FH03
30/04/2025	W02-D-Uccle-FH02
30/04/2025	W05-C-StGillisVorst-FH02
30/04/2025	W03-C-Etterbeek-FH02

As mentioned in different chapters higher in this document and in the footnote of Table 4, certain product types are or will be the subject of a global outphasing with "Stop service" dates that might precede notified "end of service delivery dates" in fiberhoods.

In order to avoid newly installed services to be migrated shortly later, Proximus sends yearly to each Wholesale customer a notice of "**Stop sell**" pursuant to the information delays contractually specified. A change of this "Stop sell" approach is currently under investigation and will be communicated timely when decided. Similarly, for each fiberhood, Proximus will send to each Wholesale customer present in the concerned fiberhood a **notice of service suspension** ("Stop Service") pursuant to the information delays contractually specified for each impacted service, as well as a list of circuits impacted and of possible service alternatives.

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