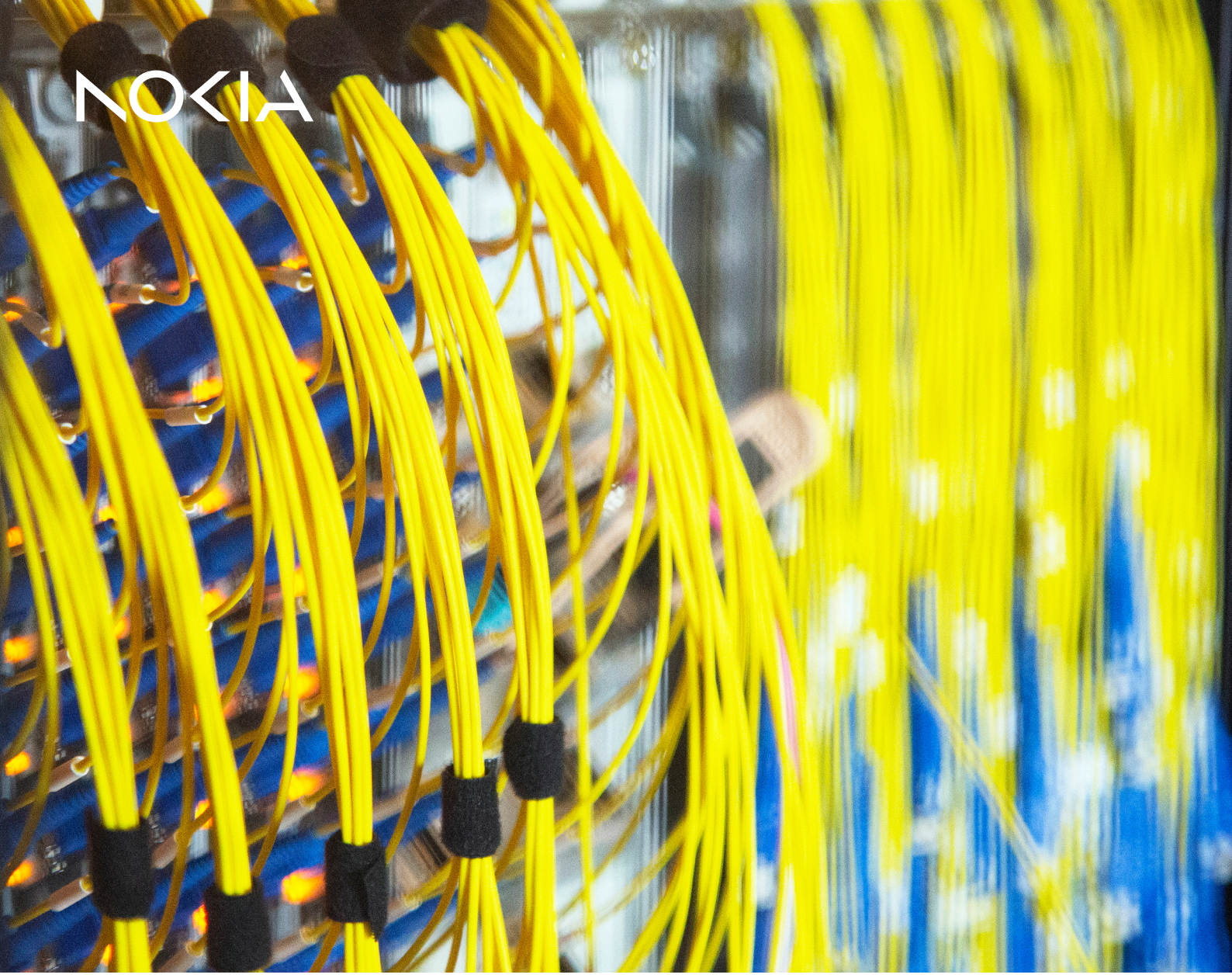


GPON or XGS-PON

Where do I start?

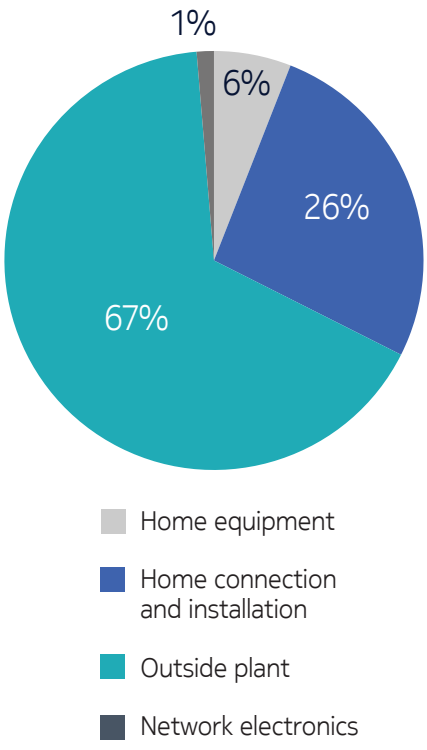
For those who are just starting with fiber deployments, the big question is: should I start with trusted and proven GPON, or jump into XGS-PON?

The technology choice is tightly coupled with cost: how do you make a fiber deployment cost effective? And fiber broadband is a long-term endeavor: how do you make the network competitive and future-proof to avoid new cycles of investment any time soon?

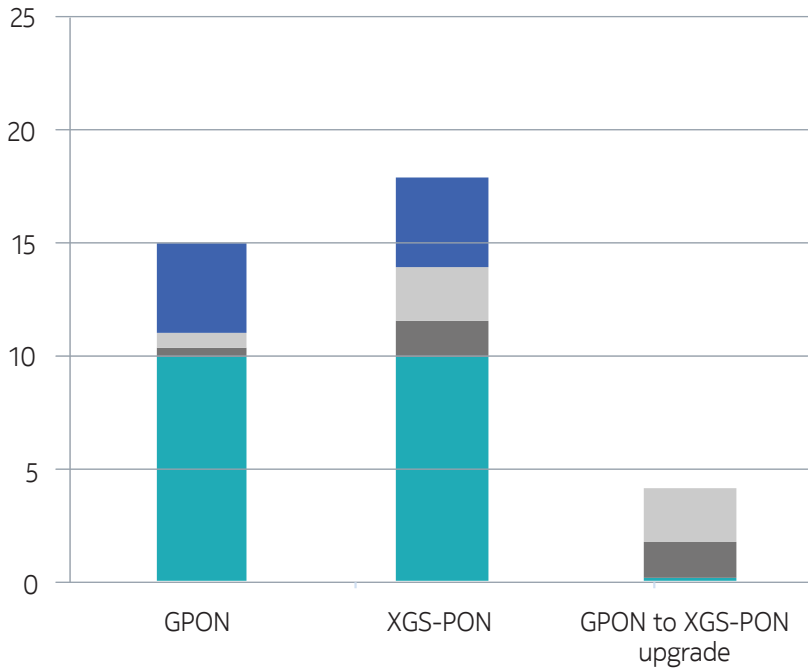
Cost considerations

The cost difference between GPON and XGS-PON is very small. That's because most of the cost is in the outside plant (the fiber cables and infrastructure), which is the same for both technologies.

FTTH cost breakdown



Relative CAPEX per subscriber (urban area)



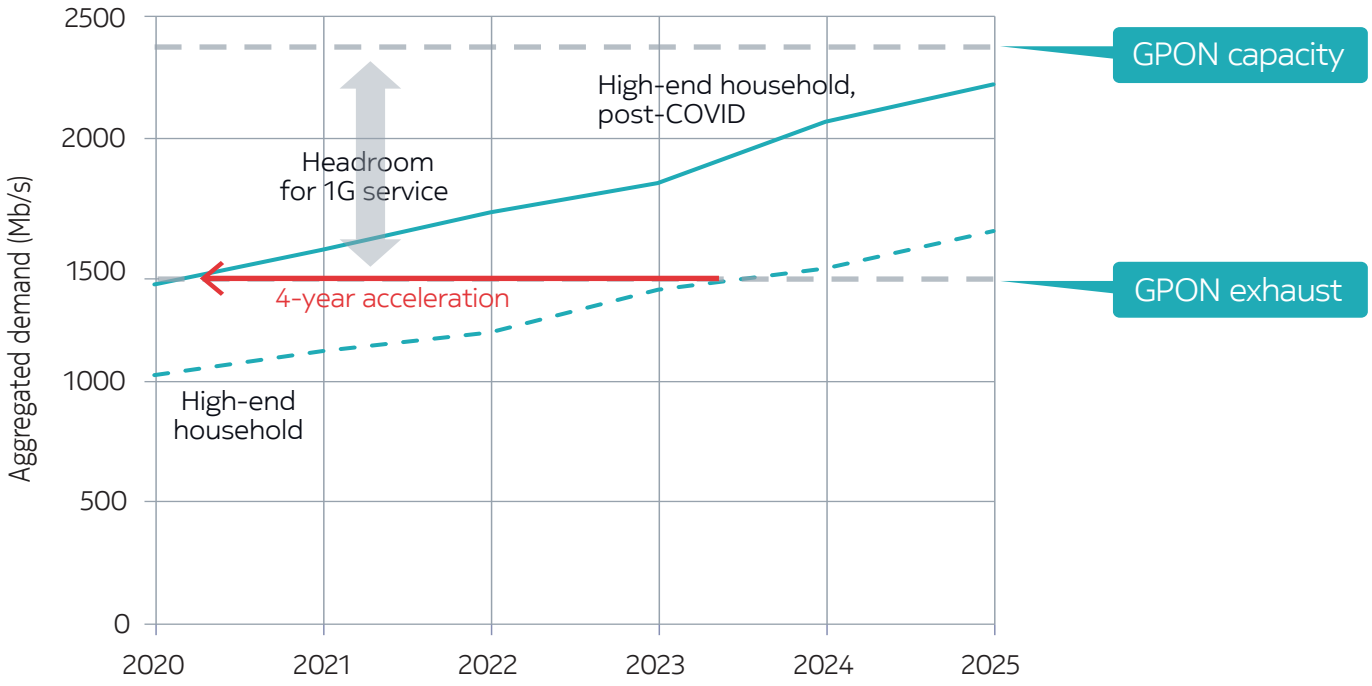
Bandwidth demand considerations

GPON was introduced 15 years ago, and it is now running out of steam. New digital consumer behaviors, the increase of video, working from home, etc., are driving the need for Gigabit speeds.

When operators deploy Gigabit services, that Gigabit needs to be available to every subscriber when they need it. After all, customers are paying for it, so they want to see that they have that bandwidth, for example when they do a speed test. To ensure that Gigabit speed is always available, operators need to have capacity in the network, known as headroom (reserved capacity) that is not allocated to subscriber services.

So, although GPON has a total capacity of 2.5G/s, providing Gigabit services means that only 1.5 Gb/s can be allocated to subscribers, and this is the point that we have now reached—3 or 4 years ahead of pre-pandemic expectations.

Bandwidth forecast
(Peak hour sustained demand, 32 subscribers)



Eliminating the need for hard decisions

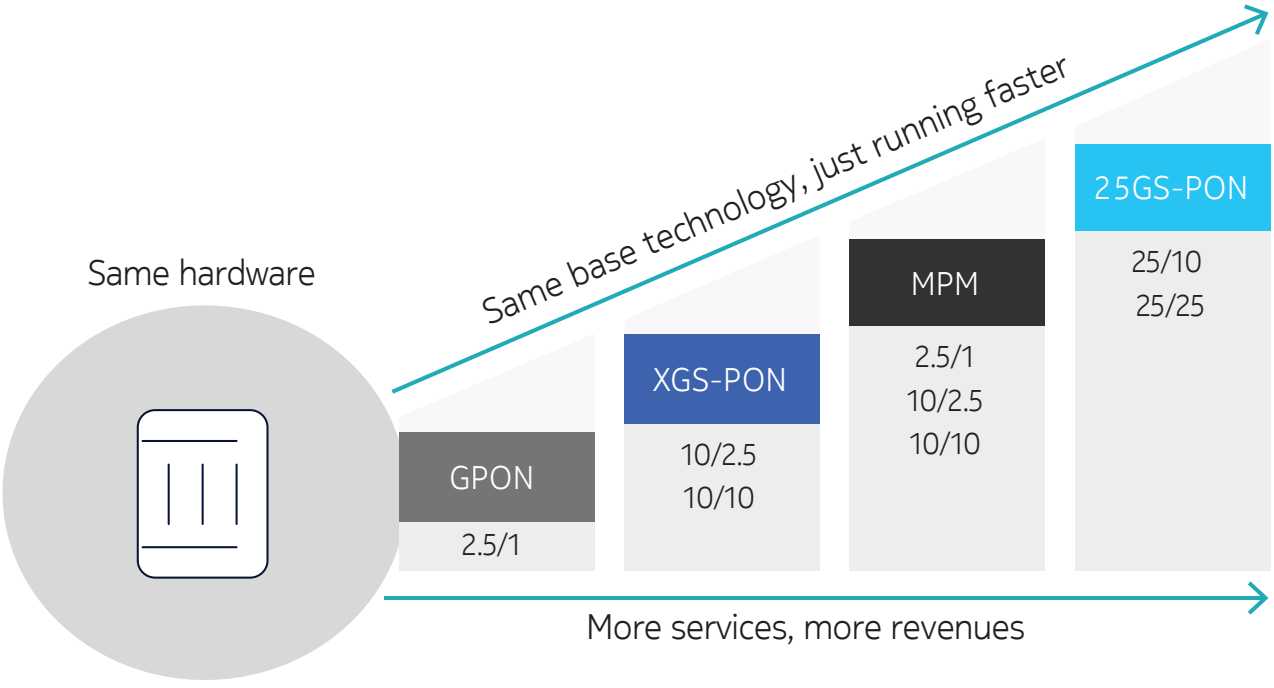
That would suggest every new fiber network should start with XGS-PON. Fortunately, technologists continue to find ways to make fiber deployments easier, quicker and more cost effective, and allow operators to choose.

Nokia Multi-PON, for example, is a universal fiber solution that is perfect for new deployments. Every port on a Multi-PON blade can work either in GPON mode, XGS-PON mode, 25G PON mode, or in Multi-PON mode: GPON and XGS-PON simultaneously. This is a huge advantage for deployments as it gives operators flexibility and choice.

XGS-PON makes perfect sense for a brand-new fiber deployment as the incremental cost over GPON is much smaller than the incremental capacity XGS-PON brings (because, as we've covered, the biggest chunk of cost—laying the fiber—is the same for both). If you start with GPON, you could well need to upgrade in just a few years. Not so with the 10G capacity of XGS-PON, so your first upgrade cycle is avoided.

But if you're really confident that you only need the capacity of GPON for the time being, it still makes sense to deploy a Multi-PON solution in GPON-only mode. This keeps the initial deployment costs lower (as GPON ONTs are cheaper) but also means you can quickly and cost-effectively move up to XGS-PON when and where needed.

Multi-PON solution for flexible deployments and future-proof capacity



Conclusion

GPON is trusted for competitive Gigabit broadband services and is the most widely deployed technology today. But XGS-PON is a game changer, and there are some very compelling reasons to go straight to XGS-PON.

- It protects your market from competitors as it's hard for them to beat you on service quality.
- It enables many more services and revenues, for example bandwidth hungry Industry 4.0 applications.
- It can easily support 4G and 5G mobile transport, which provides a great opportunity for cost savings for converged operators, or for new revenues by leasing capacity to a mobile provider.

Every operator needs to explore the best technology for them, depending on competition, cost, and demand. But innovative solutions like Multi-PON make the business case for fiber deployments much more compelling.

10G PON and beyond for rural broadband

Find out more about Nokia's fiber technologies

About Nokia

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering the future where networks meet cloud to realize the full potential of digital in every industry.

Through networks that sense, think and act, we work with our customers and partners to create the digital services and applications of the future.

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