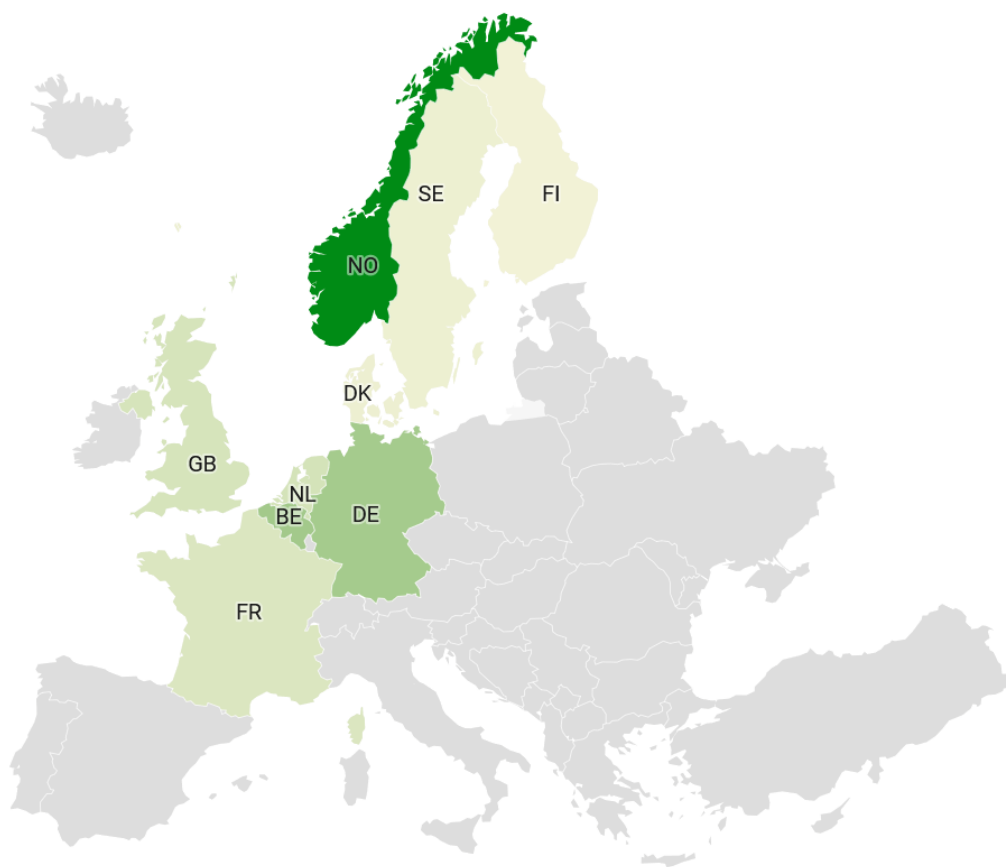


Benchmarking Danish fibre broadband pricing vs. eight other European markets – 2023

Total average 2-year fee for existing connection fibre subscription [PPP DKK]



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1. Executive summary

In this third annual version of this analysis, the basis for purchasing power parity (PPP) adjustment has been changed to use OECD's PPP conversion rates. The previous versions used IMF's GDP per capita in international USD (i.e. PPP) to derive a PPP adjustment – a method that led to larger differences in purchasing power.

The change in methodology has no effect on Denmark's numbers, only on the PPP DKK numbers of the other countries. Denmark's position *relative* to the other three countries is however influenced when measured in PPP DKK.

The two previous analyses issued in 2021 and 2022 have not been updated. This means that the outcome measured in PPP DKK in the two older analyses should not be compared with this analysis.

This analysis is commissioned by Fiberalliancen (part of Green Power Denmark) and compares Danish fibre broadband consumer pricing with that of eight comparable European countries: Sweden, Norway, Germany, the Netherlands, the UK, Belgium, France and Finland.

Purchasing power adjustment has been done to allow for better comparability of prices across the markets.

The analysis has gathered all fee components – all monthly subscription fees as well as all one-time fees – and uses the **total 2-year fees** as the ultimate comparison. We separate between two cases:

- The **new build** case in which a detached house owner connects to fibre broadband for the first time.
- The **existing connection** case in which a new consumer subscribes to fibre broadband in a house that already has an existing fibre connection.

New build: After purchasing power adjustment, the total 2-year new build fees for Danish fibre broadband are **among the more affordable** in our nine European markets. Only France is generally offering lower total fees.

Existing connection: After purchasing power adjustment, the total 2-year existing connection fees for Danish fibre broadband are **among the more affordable** in our nine European markets. Only France is generally offering lower total fees.

These positions were obtained with the following characteristics of the fee composition:

- Danish fibre broadband **subscriptions** are, alongside subscriptions in France, Finland and Sweden among the most affordable among our nine European markets.
- Danish **one-time fees for new build customers** are very low, in line with the Netherlands and the UK. Other Nordic countries, Sweden, Norway and Finland, operate with much higher one-time new build fees than the other six markets.
- Danish **one-time fees for existing connections** are in the low range of our international spectrum.

Denmark's favourable total 2-year fee position comes although Denmark's **minimum contract duration** of 6 months is approximately 3-4 months shorter than the average of all offers in all countries depending on case. Denmark's 6 months isn't the shortest, though; there are providers offering fibre broadband on non-binding contracts. Our analysis can't prove any cross-market correlation between the minimum contract duration and the fees.

Since this is an update of [similar analyses done in 2021 and 2022](#), it also examines **how the fibre pricing developed** from **July 2022 to September 2023**. During these fourteen months – for the nine markets – 54-55%¹ of comparable 2-year fees increased, 31% decreased and 14-15% didn't change. This represents an acceleration in price increases compared to the 2022 analysis. Two markets bucked this trend to instead develop towards lower 2-year fees for new fibre customers: **Denmark and the Netherlands**.

According to Ookla Speedtest data, Denmark has the fixed broadband networks with the **highest median throughput**. Since Denmark generally has low fibre broadband subscription fees, this could have contributed to a willingness to purchase higher speed subscriptions.

¹ Depending on if the new build or the existing connection case.

2. Background

This analysis is commissioned by Fiberalliancen (part of Green Power Denmark) and compares Danish fibre broadband pricing for consumers with that of eight other European countries.

3. Peer group

The following nine **countries** form the peer group of this analysis:

- Denmark
- Sweden
- Norway
- Finland
- Germany
- Netherlands
- United Kingdom
- Belgium
- France



Figure 1. The nine countries covered by this analysis.

These countries have been selected based on their geographical location in North and West Europe but also because they represent markets that show some similarities with Denmark:

December 2022	Fixed broadband household adoption	Share of fixed broadband with >=30 Mbit/s download throughput	Share of fixed broadband with >=100 Mbit/s download throughput	Share of households with fibre availability	Share of fixed broadband subscriptions on fibre	Share of broadband subscriptions being mobile data-only
Denmark	83%	88%	77%	² 79%/ 84%	49%	32%
Sweden	84%	95%	92%	³ 84%	81%	26%
Norway	⁴ 84%	⁵ 85%	⁵ 75%	⁶ 82%	⁴ 75%	⁷ 17%
Finland	61%	67%	51%	52%	63%	53%
Germany	n/a	78%	45%	32%	9%	83%
Netherlands	n/a	96%	56%	69%	30%	11%
UK	n/a	82%	n/a	⁹ 48%	12%	16%
Belgium	80%	98%	72%	10%	5%	7%
France	n/a	68%	60%	¹⁰ 77%	¹¹ 58%	¹² 9%

Figure 2. Key statistics for the nine countries covered by this analysis.

The figures in the table above typically originate from the respective national regulatory authority – but note that some numbers have different age and that not all definitions are identical. The extreme values – highest and lowest – have been highlighted.

² First half of 2022. 84% for the first half of 2023.

³ October 2022.

⁴ Excl. FWA which Nkom otherwise reports under fixed broadband.

⁵ According to Nordic-Baltic Telecom Market 2022.

⁶ June 2022.

⁷ Incl. FWA.

⁸ Mobile data-only base of 2021 since not reported for 2022.

⁹ January 2023.

¹⁰ FTTH Council Europe, September 2022.

¹¹ Excl. FWA (4G boxes).

¹² Incl. FWA (4G boxes).

Based on the table above, three countries are clearly behind Denmark in fibre availability and adoption: **Germany**, the **UK** and **Belgium**. The incumbent operators in these countries – Telekom, BT/Openreach and Proximus – did for long resist fibre rollout to instead offer faster xDSL variants. These countries are also well served by modernised HFC (cable TV) networks. Finland is ahead in fibre share of base but behind on fibre availability.

The countries closer to Denmark – figures-wise – are **France**, the **Netherlands**, **Finland**, **Norway** and **Sweden**. With regards to fibre adoption, Sweden, Norway and Finland are ahead of the other countries. Finland is though having the lowest fixed broadband adoption overall as mobile data-only subscriptions play a much larger role in Finland than elsewhere.

Tefficient has documented the currently online-offered **fibre broadband consumer**¹³ **prices** of the **two largest**¹⁴ **providers** in the overall fixed broadband markets of the nine countries: The incumbent operator plus the largest alternative provider.

- Denmark: YouSee and Norlys
- Sweden: Telia and Tele2
- Norway: Telenor and Telia
- Finland: Elisa and Telia
- Germany: Telekom and Vodafone
- Netherlands: KPN and Caiway
- UK: BT and Hyperoptic
- Belgium: Proximus and Orange
- France: Orange and Free

Across these 18 providers, the pricing of **72** different fibre broadband plans has been captured.

Recurring subscription fees as well as one-off fees have been captured.

A lower threshold of **100 Mbit/s** in download throughput has been applied.

All plans – except one from Proximus in Belgium which is limited to 150 GB per month – come with **unlimited data volume**.

All prices have been captured in between 18 and 19 September 2023.

¹³ Many consumers, living in apartments, will typically subscribe to broadband services through a group agreement administered by the landlord or the housing association. Such group agreements are not public and the pricing of these could therefore not be included in this analysis. Effectively, this means that the analysis primarily captures the pricing of broadband services delivered to consumers living in detached housing.

¹⁴ As to the Netherlands, UK and Belgium, the second largest providers in the overall fixed broadband market – VodafoneZiggo, Virgin Media and Telenet – are not yet offering full fibre broadband widely but rely mainly on HFC. Tefficient has thus replaced these providers with the second largest *fibre* broadband provider of each country. Statistics on size for alternative fibre providers are often hard to get, but Tefficient has assessed that this is Caiway in the Netherlands, Hyperoptic in the UK and Orange in Belgium.

4. Observed data issues

- Some fixed broadband providers are only stating prices after a **specific address** has been inserted. This is done since the pricing may depend on who (the provider or a regional infrastructure partner) is delivering the underlying broadband infrastructure. In some cases, Tefficient has been able to obtain complete price lists, but in other cases **example addresses** have been used to generate prices.
- **New build connection fees** (for new connections into homes) are sometimes more difficult to find than monthly subscription fees. The reason is that they can vary according to region and neighbourhood – but Tefficient also senses that these fees are negotiable in certain countries such as Norway and Sweden – often against a binding contract. All providers not stating connection fees in their price lists have been contacted directly by Tefficient to, at least, give indications of what the connection fees *typically* are.
- In two countries, **pure fibre broadband plans aren't offered** by the studied providers: In **Germany** all fibre broadband plans also come with fixed telephony (a type of double-play or "2p"). In **France** all fibre broadband plans also come with fixed telephony and with TV (triple-play or "3p").

5. Overview of pricing analysis

The following image is used in the analysis to help the reader navigate between the comparisons of different price components:

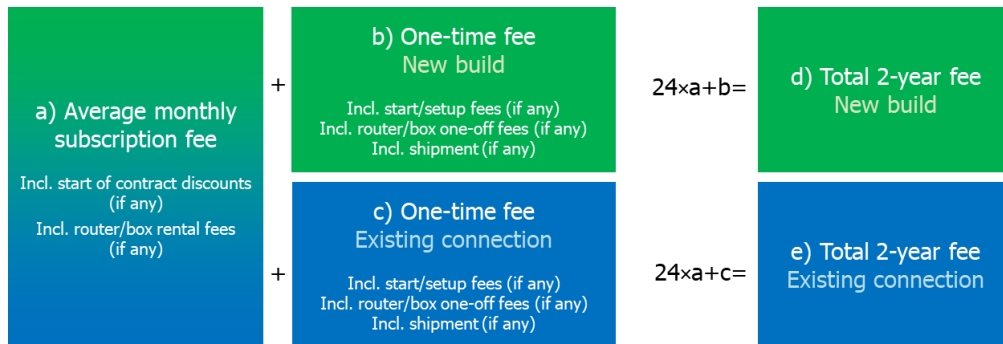


Figure 3. The price comparisons of the analysis outlined

The price component usually highlighted in the sales and marketing messages of the providers is the **monthly subscription fee**. Since different providers use different tactics to lower their monthly subscription fee – including start-of-contract discounts and a separate router or box rental fee – we will in this analysis calculate an *average* monthly subscription fee based on a 24-month subscription period. This price component is called a) in Figure 3 and is the same regardless of if the customer requires a new build or have/take over an existing fibre connection.

In certain countries, Sweden particularly, the **one-time fee for a new build** is significant. We call this price component b) and it will include also other one-time fees that providers might charge – such as router/one-off fees or shipment fees.

With an increasing reach of fibre networks, it will gradually become more common that a detached house already has an existing fibre connection – perhaps installed by the previous owner of the house. We call this price component c) – **one-time fee for an existing connection** – and it tends to be much lower than b) as no fibre installation and no digging are required.

The most complete picture of the pricing is obtained by comparing the *total* fees – subscription and one-time fees – over a certain period. In this analysis we have calculated the **total fees over a 2-year period**. We call that d) for the new build option and e) for the existing connection option.

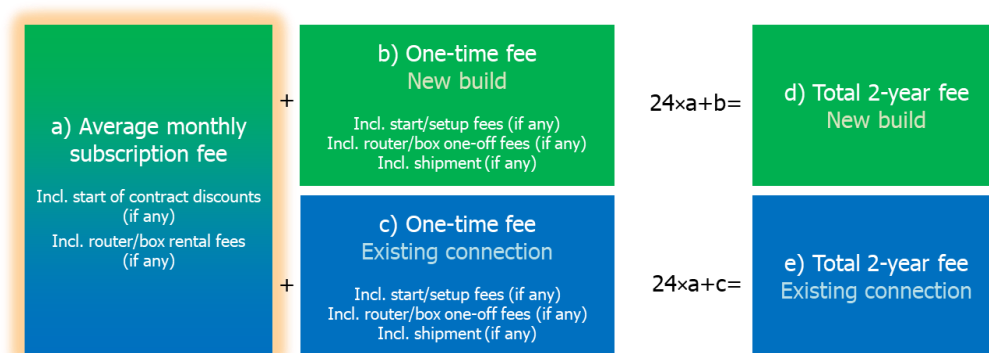
The component currently analysed will be highlighted in the beginning of each pricing section.

To introduce the purchasing power parity method, we will make the first pricing comparison a) twice:

- Actual fees in DKK.
- Adjusted fees in PPP DKK – adjusted for general differences in country purchasing power.

The following pricing comparisons b)-e) will be in PPP DKK only.

6. Average monthly subscription fee



Fibre providers are generally using the monthly subscription front book prices as “sticker prices” and hence trying to keep them as low as possible. A usual practice is to discount the price during a limited time upon start of a contract: We have found providers giving discount for the first month, the first 2 months, 3 months, 6 months, 9 months, 12 months and 24 months in our studied markets. This type of discounting now happens in all our studied countries.

The habit to have different fees during different stages of a customer engagement means that it’s a big difference for the price comparison if we compare the prices during first month of an engagement – or later. To make the comparison as fair as possible, this analysis defines a **comparison period of 24 months**. We have calculated how much it will cost a customer during that time – and based on that calculated an **average monthly subscription fee** – valid for the first 24 months¹⁵.

Another, less common, way to make monthly “sticker price” low is to charge an additional monthly subscription fee for customers who need a **router**¹⁶. Two providers in our peer group – Vodafone in Germany and Telia in Norway – have this practice while, at the same time, not giving customers a possibility to opt-out by using an existing router. In this analysis we have not included a router rental fee unless a provider mandates it. Two providers, Telenor Norway and Elisa Finland, recommend customers to rent a router and charges a fee for it but as it isn’t mandated, the cost isn’t included. Most providers in the analysis require their customers to use the router of the provider, but don’t charge a monthly subscription fee for it¹⁷.

All plans – except one from Proximus in Belgium which is limited to 150 GB per month – come with **unlimited data volume**. In all other cases, the defining parameter for the monthly service subscription price is instead the download throughput – measured in **Mbit/s**.

¹⁵ Providers in the UK adjust prices annually based on the official Consumer Price Index plus, typically, an additional 3-4%. Since we can’t not say how large these prices changes will be, it’s not considered in this analysis which tends to underestimate the 2-year prices in the UK relative to other countries.

¹⁶ Or a triple-play box in countries where a pure fibre broadband option isn’t offered. In these cases, none of the providers studied however charge a subscription fee for a box.

¹⁷ Often, they charge a shipping fee, though, something this analysis takes into account when comparing the one-time and 2-year fees.

Figure 4 below compares the average monthly subscription fee (excluding one-off fees)¹⁸ of all offered consumer fibre broadband subscription plans to the maximum download throughput (if at least 100 Mbit/s) in Danish kroner (DKK)¹⁹.

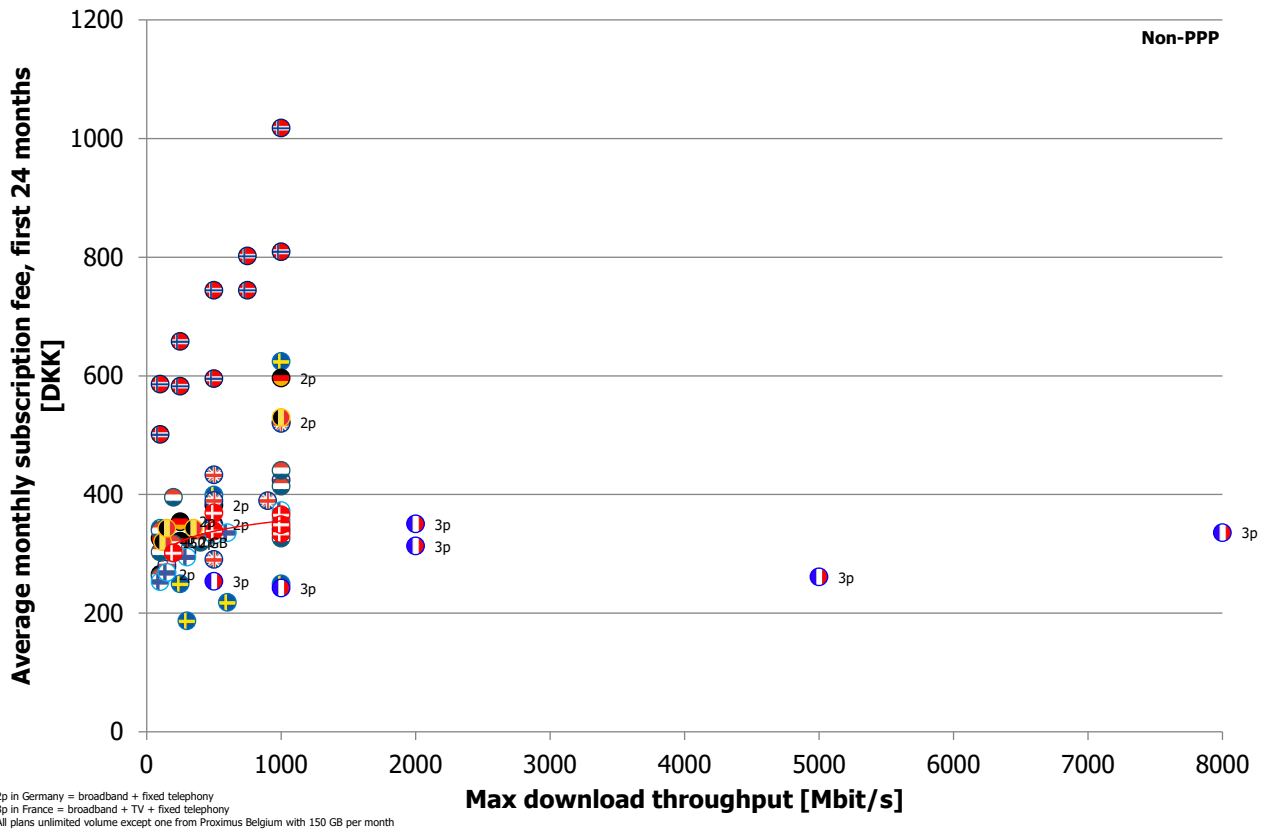


Figure 4. Comparison of the average monthly subscription fee in DKK during the first 24 months to the max download throughput in nine countries, September 2023 [source: providers' webpages and pricelists complemented by direct emails to providers when necessary]

Let's first highlight that there are two French plans offering up to 5000 and 8000 Mbit/s maximum download throughput. These are both from Free and delivered with the Freebox Pop and the Freebox Delta router respectively. That throughput is shared over several ports on the router – the fastest port delivers 2500 Mbit/s. Since these two plans will decrease the readability in the part of the graph where most plans are, we will exclude them from the graphs in the rest of the report. Excluding them does not change the conclusions.

¹⁸ Excluding connection one-time fees, equipment one-time fees and other one-time fees (if any). The total costs will be compared later in the analysis. All prices include VAT (valid throughout the analysis).

¹⁹ Using the exchange rates of 18 September 2023: 1 NOK=0,64777 DKK, 1 SEK=0,6248 DKK, 1 GBP=8,66106 DKK and 1 EUR=7,45724 DKK

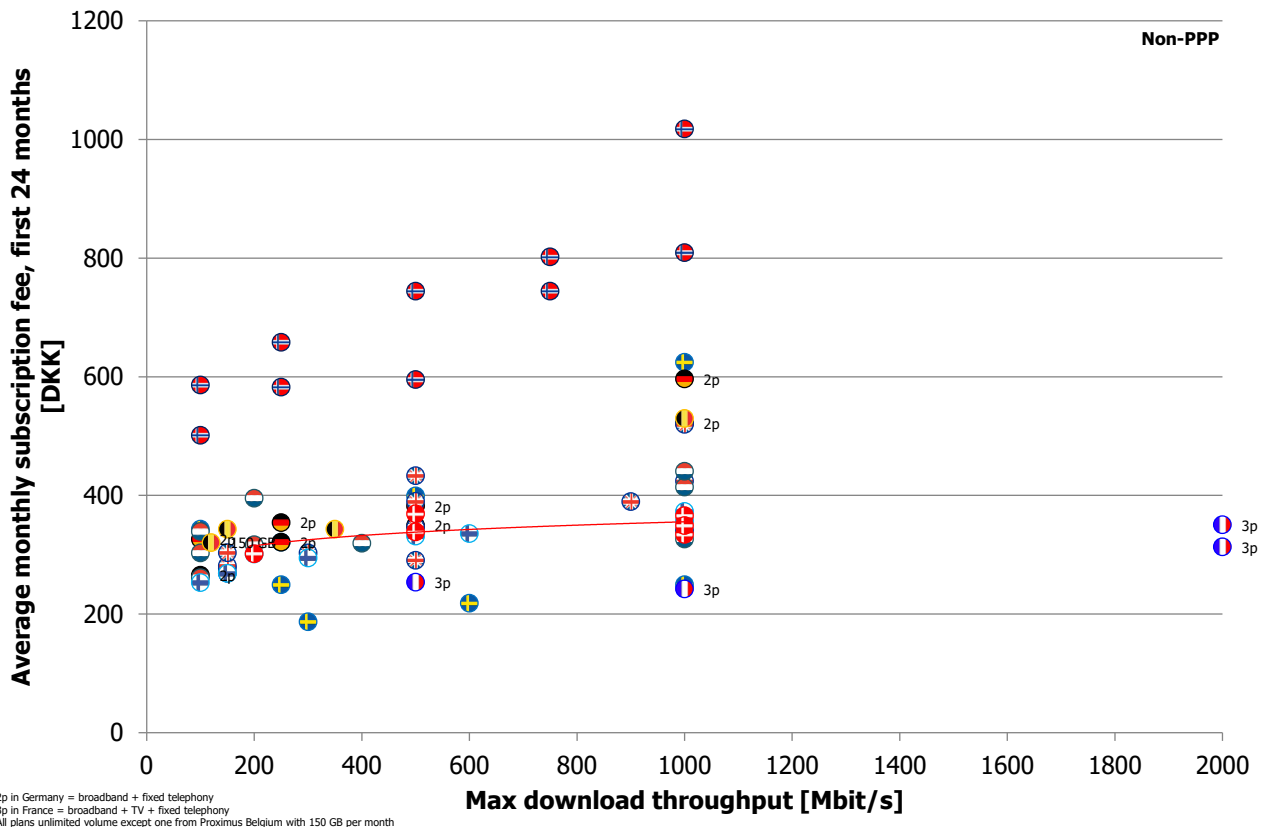


Figure 5. Comparison of the average monthly subscription fee in DKK during the first 24 months to the max download throughput (up to 2000 Mbit/s) in nine countries, September 2023 [source: providers' webpages and pricelists complemented by direct emails to providers when necessary]

In the zoomed-in graph, see Figure 5, we can first conclude is that there is a significant difference in how much a fibre broadband plan averagely costs per month during the first 24 months: **Norway** is uniquely positioned with monthly subscriptions sometimes twice as costly as in the typical non-Norwegian European market. This is before purchasing power adjustment.

As mentioned, pure fibre broadband plans aren't offered by the studied providers in Germany and France. All German fibre broadband plans also come with fixed telephony – these are marked **2p** in our graphs to allow us to remember that there's an additional, non-optional, element included. All French fibre broadband plans also come with fixed telephony and TV. These are marked **3p** in our graphs.

It's too early to conclude on the position of Denmark – we'd like to do purchasing power adjustments first – but we just want to point out that the **red** trend line is based on the Danish fibre subscriptions offered – to help identifying Denmark's position.

Let's now apply purchasing power adjustments to Figure 5 and see if that changes the positions of the countries. But first a bit on the methodology used. Skip the text in **blue** in between the two horizontal dividers below if you'd like to go directly to the results.

We just compared prices in a common currency (DKK). Although correct, it doesn't consider that the average inhabitant of one country has a different purchasing power than the average inhabitant of another country. A common way to deal with this is **purchasing power parity** (PPP) conversion. An introduction to PPP is given in the box below²⁰.

Measuring economic activity in a country is difficult, since 'the economy' is a complex system with lots of moving parts. A common way to deal with this is to focus on aggregate indicators, such as total national output: "the monetary value of all goods and services produced within a country (or region) in a specific time period". That's what economists call the Gross Domestic Product (GDP).

GDP is measured using prevailing national prices to estimate the value of output. In other words, GDP is calculated using local currency units. This means that in order to make meaningful cross-country comparisons, it is necessary to translate figures into a common currency – i.e. use a consistent 'unit of measure'.

One option is to simply translate all national figures into one common currency (for instance, US dollars) using exchange rates from currency markets. But because market exchange rates do not always reflect the different price levels between countries, economists often opt for a different alternative. They create a hypothetical currency, called 'international dollars', and use this as a common unit of measure. **The idea is that a given amount of international dollars should buy roughly the same amount – and quality – of goods and services in any country.**

The exchange rates used to translate monetary values in local currencies into 'international dollars' (int-\$) are the 'purchasing power parity conversion rates' (also called PPP conversion factors).

The input (and for 2022 also output) parameters for the PPP adjustment are shown in Table 2 below.

	Purchasing power parity (PPP) Total, National currency units per US dollar 2020	Purchasing power parity (PPP) Total, National currency units per US dollar 2021	Purchasing power parity (PPP) Total, National currency units per US dollar 2022	Exchange rate adjusted to Danish purchasing power level [national currency to PPP DKK] 2022	Rate between official exchange rate 2022 and the rate adjusted to Danish purchasing power level
Denmark	6,551107	6,589808	6,404699	1	1
Sweden	8,668483	8,721548	8,750849	1,366316981	1,04572368
Norway	9,879879	9,512157	8,882011	1,386796007	0,979204341
Finland	0,823022	0,82669	0,813035	0,126943514	1,058868397
Germany	0,725002	0,736277	0,728312	0,113715258	1,182044325
Netherlands	0,763397	0,769964	0,764114	0,119305216	1,126660507
UK	0,685567	0,676658	0,68126	0,106368777	1,07761988
Belgium	0,730278	0,736686	0,724081	0,113054649	1,188951328
France	0,71036	0,718667	0,700999	0,109450733	1,228100278

Figure 6. Comparison of purchasing parity (in international USD) in Denmark and the other eight countries 2020, 2021 and 2022, the PPP adjusted exchange rate for 2022 [source: OECD] and the rate between official exchange rate [source: ECB] and the PPP adjusted exchange rate.

²⁰ From Our World in Data: <https://ourworldindata.org/what-are-ppps>

If comparing the official currency exchange rates for 2022 with the last column of Table 2, it shows that Denmark (with a value of 1) has the second highest purchasing power (after Norway with 0.979).

Applying PPP on the fibre broadband pricing is, in general, a modelling attempt to make the levels more comparable between the countries. Since PPP is calculated on a *generic* basket of goods and services, it isn't developed specifically for fibre broadband. The outcome after PPP adjustments should therefore be regarded as *indicative*. You could say that the logic of applying PPP on fibre broadband pricing is "with higher general purchasing power, buyers are expected to pay as much more for fibre broadband services as they pay for goods and services in general".

With this disclaimer, let's now apply the differences in PPP on the previously shown average monthly subscription fees.

In Figure 7 below we have adjusted the prices of the other countries to the Danish purchasing power level. This means that all other country dots moved, but the Danish dots stayed in the same position.

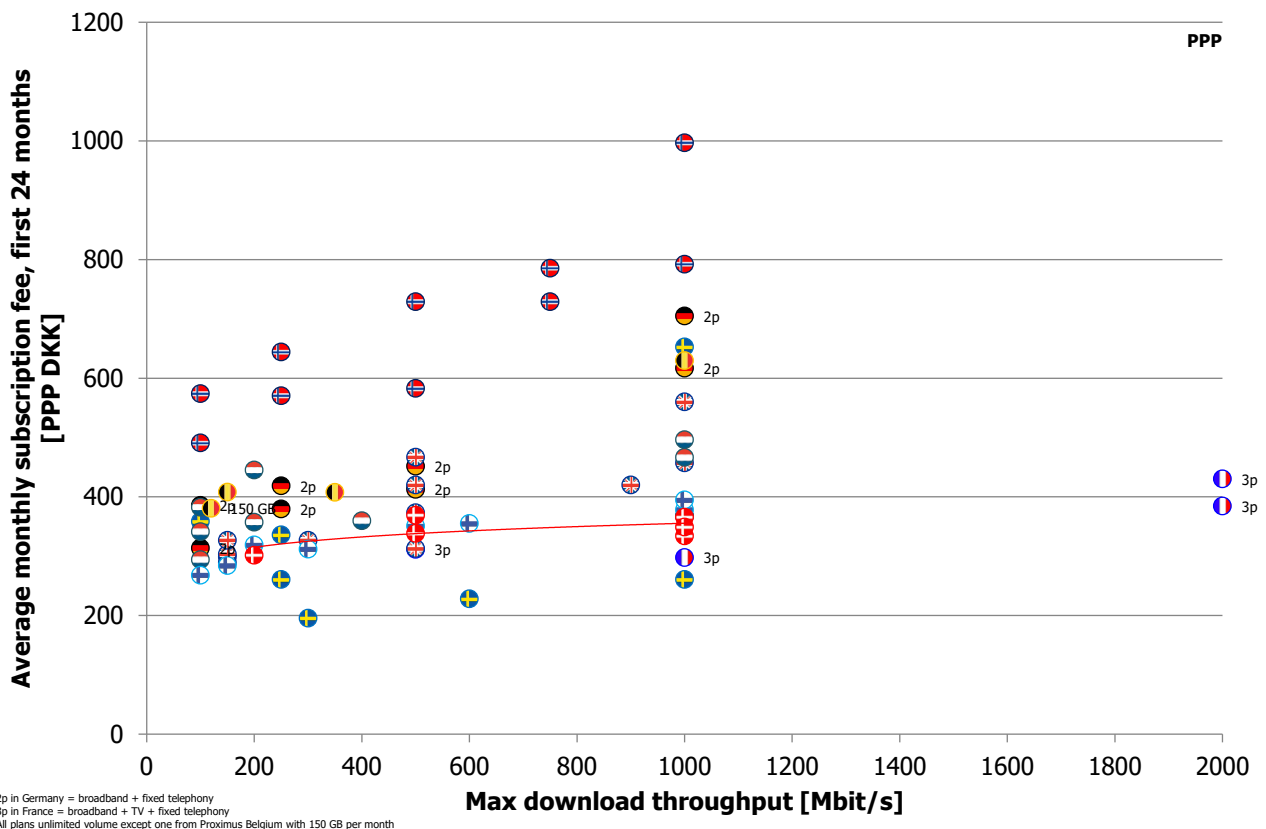


Figure 7. Comparison of the average monthly subscription fee in PPP DKK during the first 24 months to the max download throughput (up to 2000 Mbit/s) in nine countries, September 2023 [source: providers' webpages and pricelists complemented by direct emails to providers when necessary, OECD²¹].

²¹ The purchasing power adjustment is based on OECD's figures for 2022 as 2023 isn't available. That's valid throughout the analysis.

Compared to the non-adjusted graph, Figure 5, the position of Norway is now somewhat less extreme as Norway's high purchasing power 'forgives' some of the price differential to the other countries. Norway moved *downwards* in the graph as it's a country with higher purchasing power than Denmark.

All other countries – such as Sweden and France – have lower purchasing power than Denmark and have moved *upwards* in the graph as one could expect fibre broadband to be less costly there as the purchasing power is lower.

There is of course some spread in the Danish fibre broadband prices, but the red line is a best fit trend line based on the Danish fibre subscriptions offered. The slowest offered²² Danish fibre broadband subscription is 200 Mbit/s and from that speed, Danish fibre subscriptions are among the more affordable after purchasing power adjustment. Also French, Finnish and Swedish plans are generally affordable (alongside a few occasional plans from other markets) after purchasing power adjustment.

The French subscriptions are generally the most affordable among our nine markets – considering that they are triple-play including fixed telephony and TV. [There's a fact box at the end of section 9 giving some explanation to the position of France].

After purchasing power adjustment, Danish fibre broadband subscriptions are, alongside subscriptions in France, Finland and Sweden, among the most affordable among our nine European markets.

One possibly determining factor for the monthly fibre subscription price could be the minimum contract period – or **binding period**. Different providers apply different policies – even within countries.

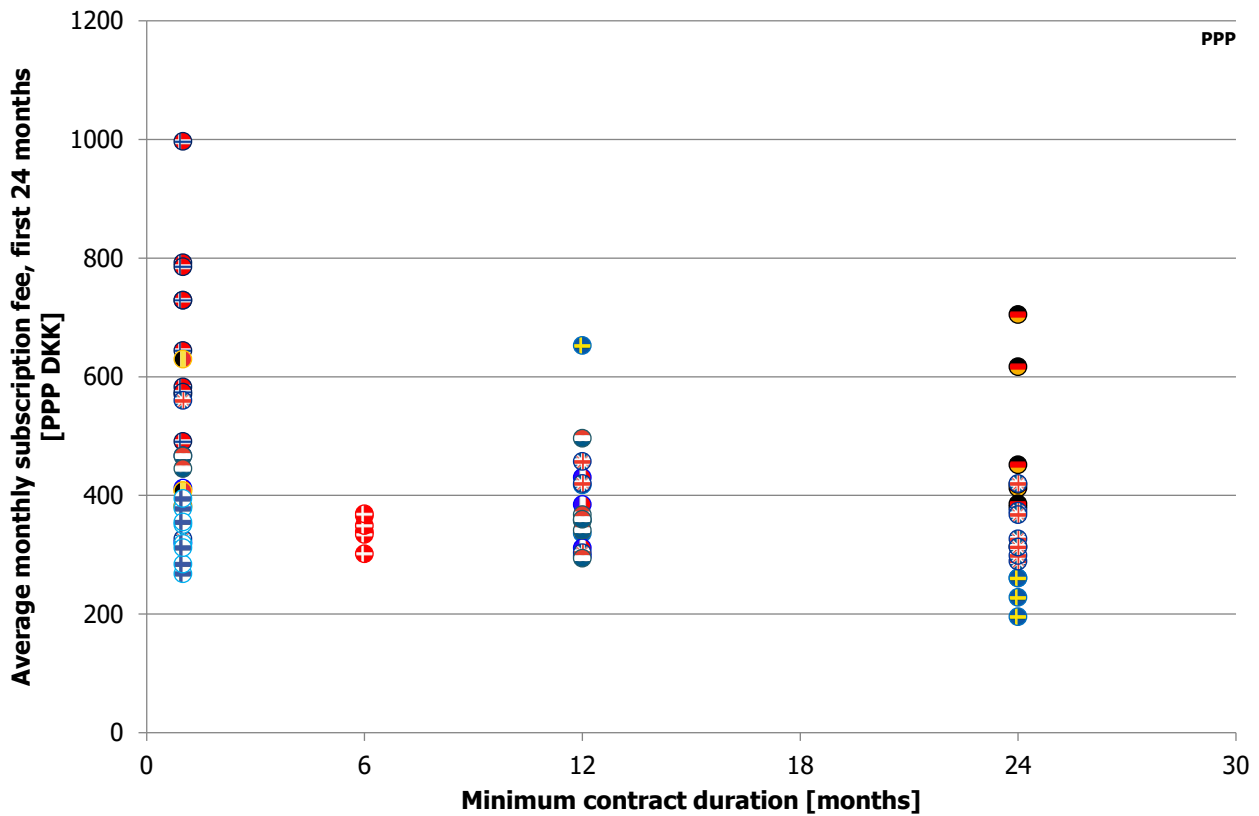
As to **non-binding contracts** (visualised as 1 month in the following graphs), these are always offered by the two largest Norwegian operators, **Telenor** and **Telia**²³, and by the Belgian providers **Proximus** and **Orange** as well as Finland's **Elisa** and **Telia. Free** in France is only offering non-binding contracts on its most expensive 5000 and 8000 Mbit/s plans. **Hyperoptic** in the UK lets the customer decide between a 12-month binding period (with discount) and a non-binding alternative. Finally, **KPN** who in the Netherlands gives a 3 EUR discount for contracts with 12-month binding period compared to the non-binding options.

All other providers stipulate a set binding period; in Denmark's case always 6 months – for other countries 12 or 24 months.

In the first, 2021, version of this analysis, we thoroughly examined if the minimum contract period was a determining factor for subscription fees but concluded that there was only vague evidence for that longer contract periods result in lower subscription fees. With this in mind, we have downsized this part of the analysis to just one chart since.

²² There are slower plans than that offered in Denmark, but remember that this analysis has a general minimum threshold of 100 Mbit/s.

²³ But not by e.g. the "Altibox partner" providers that aren't covered by this analysis.



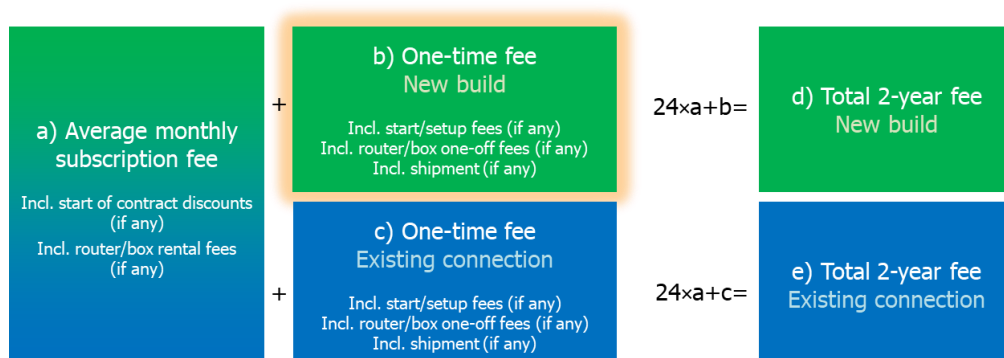
All plans unlimited volume except one from Proximus Belgium with 150 GB per month

Figure 8. Comparison of the average monthly subscription fee in PPP DKK during the first 24 months to the minimum contract duration in nine countries, September 2023 [source: providers' webpages and pricelists complemented by direct emails to providers when necessary, OECD].

It's hard to see any correlation between the monthly subscription fee and the minimum contract duration. With all the studied Norwegian plans being non-binding (shown as 1-month minimum contract duration) the eye can be fooled to think that the fee comes down with a longer contract duration, but if removing Norway, this is not the trend. No other country than Denmark operates with 6 months contract duration.

We therefore hold onto the conclusion from the first analysis that there's only vague evidence for that longer contract periods result in lower fees.

7. One-time fee – new build



As mentioned, new build one-time fees (for new connections into homes) are more difficult to find and track than monthly subscription fees. One reason is that they can vary according to region and neighbourhood. In all our countries, broadband providers can balance the requirement to rollout a fibre network of their own with **commercial agreements to offer internet services over partner networks**. So called open fibre networks is the historical norm in Sweden whereas agreements in other countries as e.g. France historically were more bilateral between companies. Initiatives towards open fibre concepts have now been taken in Denmark, Finland, the Netherlands, the UK, Germany and Belgium while there's talk about it in Norway.

When tracking the pricing of operators, you might also – on top of this – get a sense that the information on the new build one-time fees sometimes deliberately is kept out of the public domain. This is particularly true for Sweden and Norway. They seem to be used during negotiations to convince new customers to accept e.g. binding contracts or a subscription to a higher throughput tier.

In the cases where connection fees weren't found online, most providers did provide range or example indications on request. The graph below presents the information obtained.

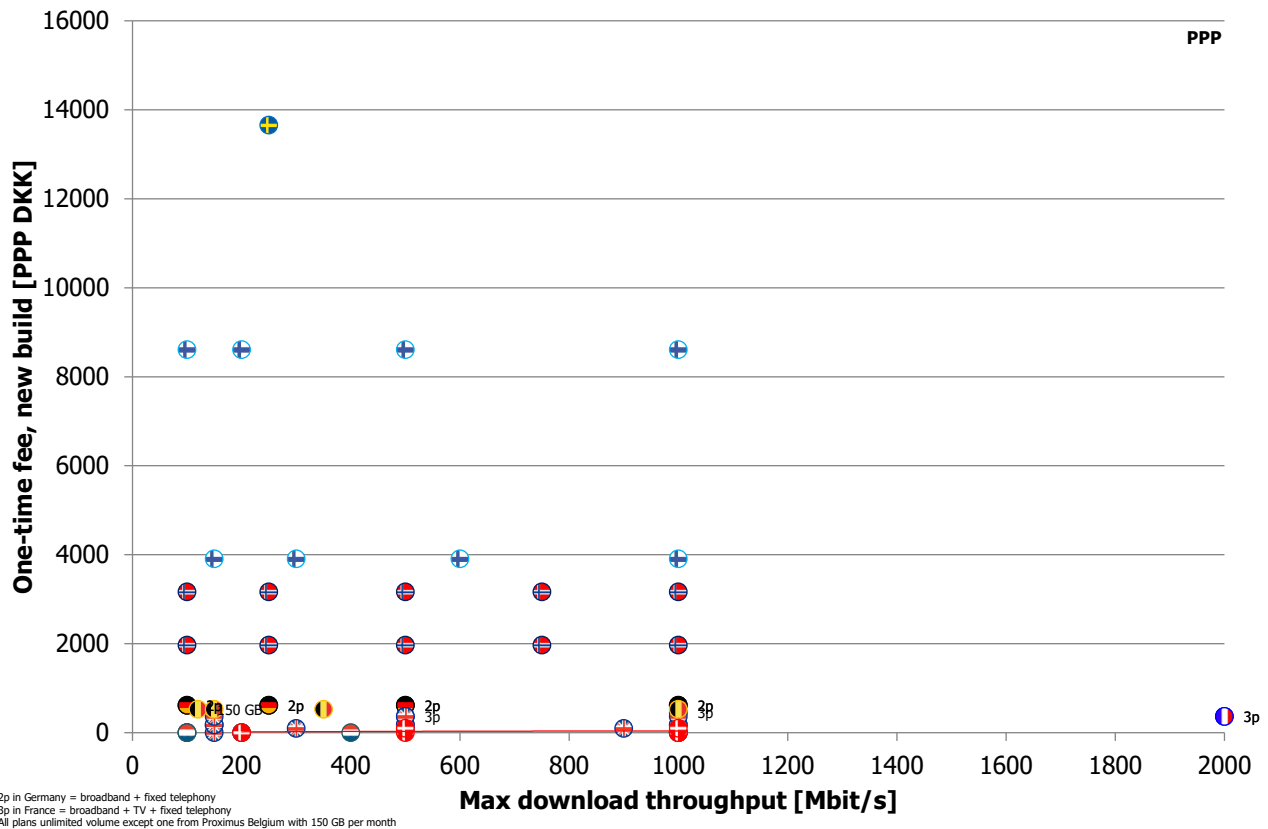


Figure 9. Comparison between one-time fees in PPP DKK for new fibre broadband into a detached home to the max download throughput (up to 2000 Mbit/s) in nine countries, September 2023 [source: providers' webpages and pricelists complemented by direct emails to providers when necessary, OECD].

Before looking at the position of different countries, let's first conclude that the one-time fees *don't* depend on the download throughput tier selected by a consumer – providers generally apply the same one-time fee regardless of which speed a consumer is intending to subscribe to.

Looking at the country positions, **Sweden** stands out in Figure 9 with one-time fees of about 14000 PPP DKK. The high fees are perhaps also a consequence of Sweden's high fibre availability: 81% of the fixed broadband base already subscribed to fibre in December 2022; higher than any other market analysed here. When the Swedish fibre broadband push started more than ten years ago, the one-time fees were lower. Perhaps the high fees of today are a reflection of that the unconnected parts of Sweden aren't that attractive to build? Regardless of these explanations, Sweden is an outlier in Figure 9.

Finland has significantly lower one-time fees than Sweden, but still higher than all other markets. **Norway** follows with the third-highest one-time fees.

In contrast to its Nordic peers, **Denmark** has very low one-time fees. At present, with campaigns ongoing, often actually zero. Denmark shares the position of having the lowest one-time fees for new builds with the Netherlands and the UK.

After purchasing power adjustment, Danish one-time fees for new build customers are very low, in line with the Netherlands and the UK. Other Nordic countries, Sweden, Norway and Finland, operate with much higher one-time new build fees than the other six markets.

Generally speaking, there should not be any substantial difference in the cost for a provider to connect a detached house to its fibre network between our studied markets. So how come some providers charge more than ten thousand PPP DKK – while others do not charge any one-time fees? A hypothesis is that providers operating with long **binding periods** in their consumer contracts are keener to subsidise the one-time fees – while those without binding periods need to recover their investments upfront.

Figure 10 compares the one-time fees with the minimum contract duration.

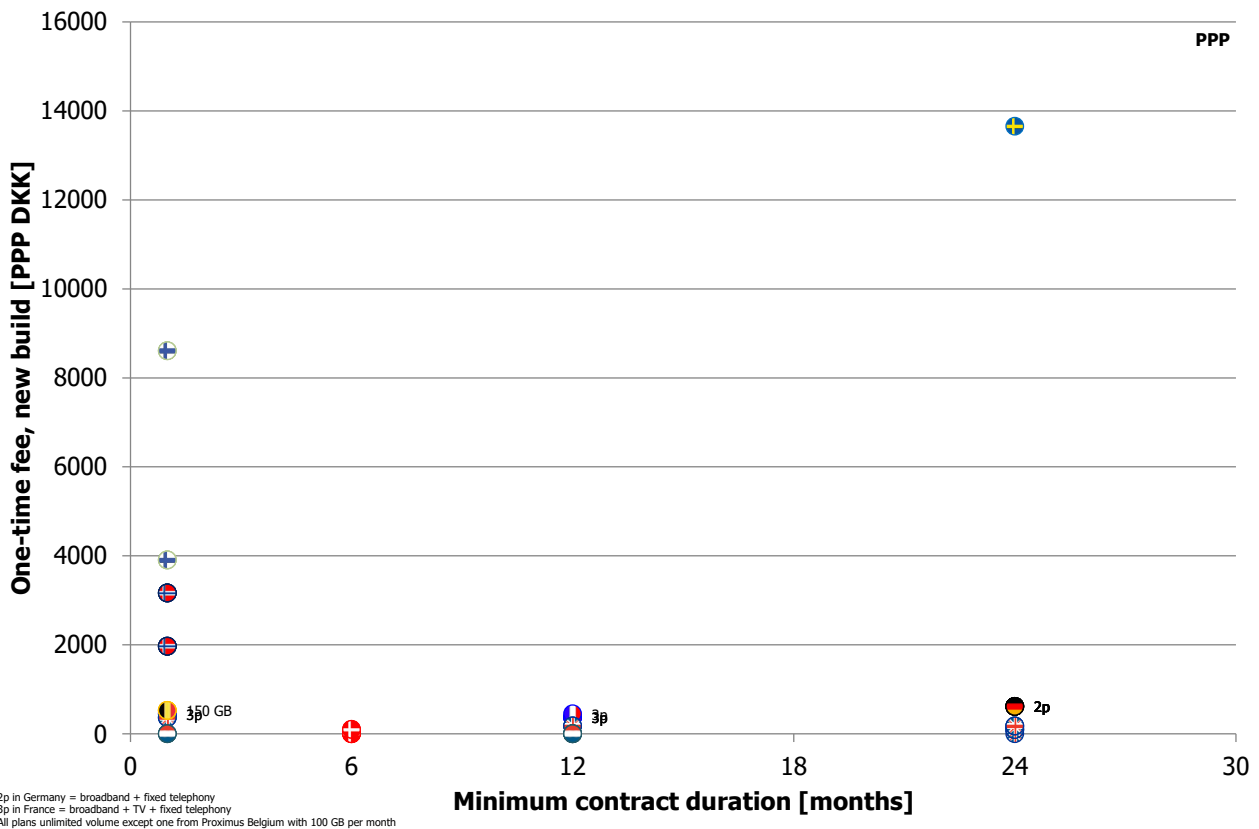


Figure 10. Comparison between one-time fees in PPP DKK for new fibre broadband into a detached home among providers to the minimum contract duration in nine countries, September 2023 [source: providers' webpages and pricelists complemented by direct emails to providers when necessary, OECD].

The high one-time fees in Sweden obviously have nothing to do with a relaxed binding period; in contrast this high one-time fee comes with the longest minimum contract duration: 24 months.

If disregarding Sweden, the graph is to some extent (up to 12 months) supporting the hypothesis that longer minimum contract duration lowers the one-time fee for the consumers. Finland's and Norway's relatively high one-time fees e.g. come without a requirement to stay for longer than one month. On the

other hand, Germany could have quite high one-time fees even though contracts have binding periods of 24 months.

Among our nine countries, it is only **Denmark** that applies a 6-month binding period.

The average binding period for new build cases at all our analysed countries and offers from the providers is **9.3 months**.

Denmark's minimum contract duration of 6 months is approximately 3 months shorter than the average of all countries. From our analysis it is hard to see that the minimum contract duration has any correlation with the one-time fees for new builds. Sweden e.g. has the highest one-time fees and the longest binding period.

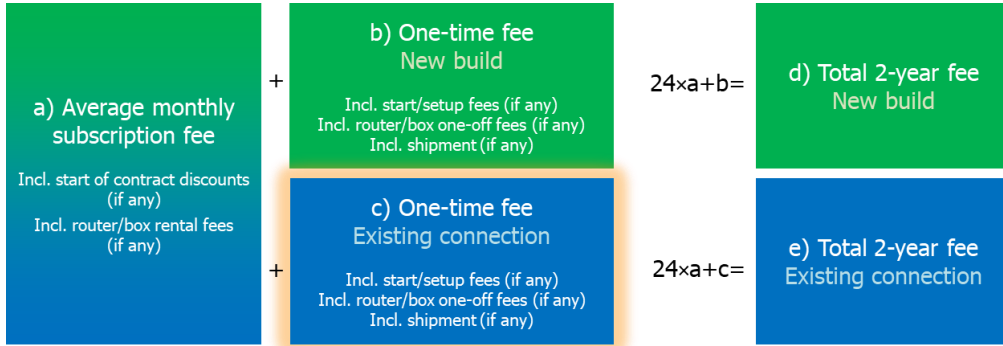
The one-time fees for new build connections are obviously very important in countries with low fibre penetration. Among our markets that's true for Germany, the UK and Belgium. In the other markets – and specifically in Sweden, Norway and Finland – a significant share of the fixed broadband base is already on fibre. Figures for December 2022 from the table in section 3:

- Denmark 49%
- Sweden 81%
- Norway 75%
- Finland 63%
- France 58%
- Netherlands 30%

This is the share of the total (B2C+B2B) fixed broadband base that *subscribes* to fibre²⁴. A larger share of that base *could have* fibre as the availability obviously exceeds the customer base.

²⁴ In reality though, many of these fibre subscriptions are delivered to apartments; the take-up in detached homes is lower since the homepass (how many homes that could get fibre would they like to) generally, due to the cost to build networks, is much lower in detached housing areas than in apartment housing areas.

8. One-time fee – existing connection



For the growing share of people lucky enough to move into a house in which fibre already is available, we in this section compare the one-time fees that comes with an *existing connection*. As no digging is required, we should of course expect to see lower one-time fees.

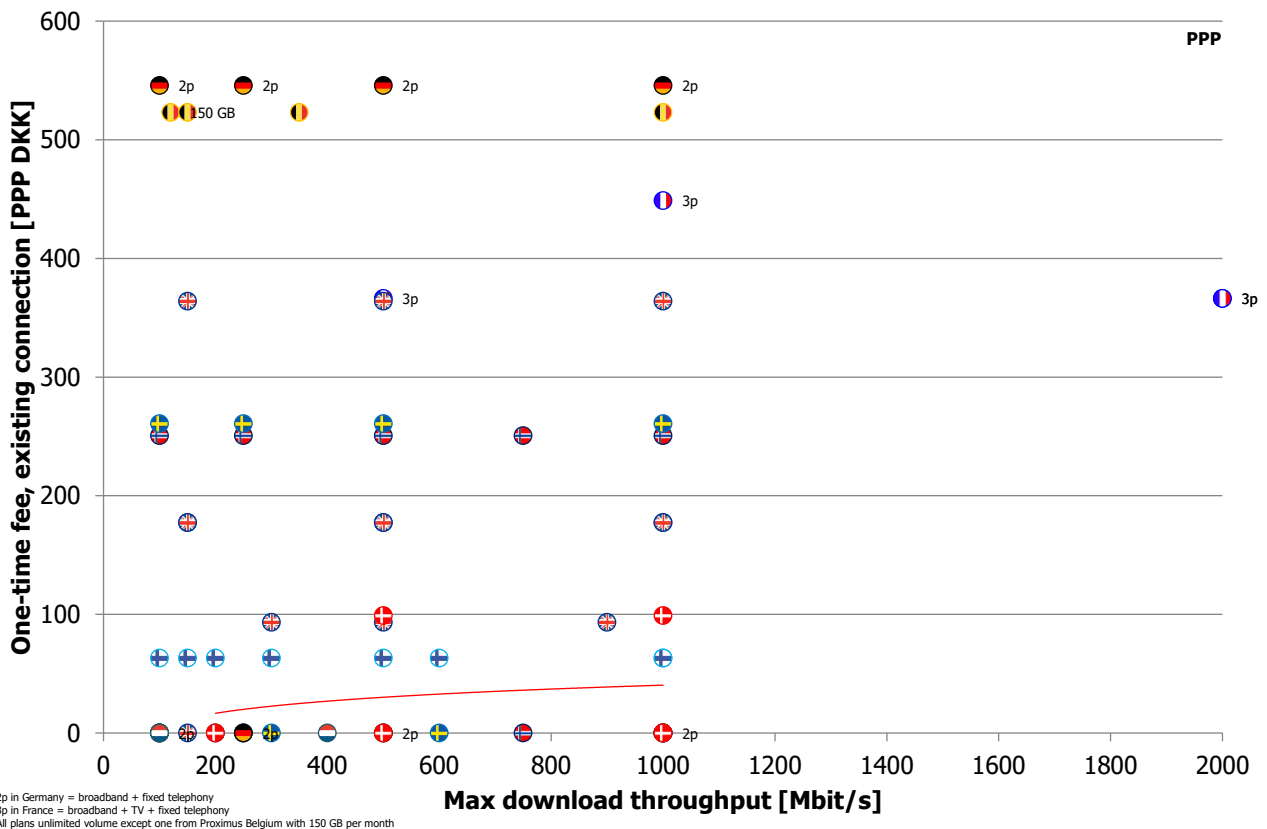


Figure 11. Comparison between one-time fees in PPP DKK for a new fibre customer on an existing connection to the max download throughput (up to 2000 Mbit/s) in nine countries, September 2023 [source: providers' webpages and pricelists complemented by direct emails to providers when necessary, OECD].

Figure 11 above is also showing much lower one-time fees when connecting an existing connection to a new subscriber (compared to the new build case) – the average is around 250 PPP DKK. Some German and all Belgian options come with higher one-off fees. Also the French offers come with relatively high fees explained by the need to provide a TV set-top box as all the French offers are triple-play (3p).

There are several providers – across markets – that do not charge any one-time fees when taking up a fibre broadband subscription on an existing connection.

In the Danish market, the set-up fee (“oprettelse”) is currently waived, and the only possible one-time charge is an occasional 99 DKK for shipping of a router. Compared to most other markets, Denmark is again in the low-cost range.

After purchasing power adjustment, Danish one-time fees for existing connections are in the low range of our international spectrum. Over a longer time period, these one-time fees are however not significant.

We will soon calculate the total 2-year fees to see if this one-time fee for an existing connection has a negative impact on the total. But first an analysis of the possible effect minimum contract periods (binding periods) has on the one-time fees for existing connections:

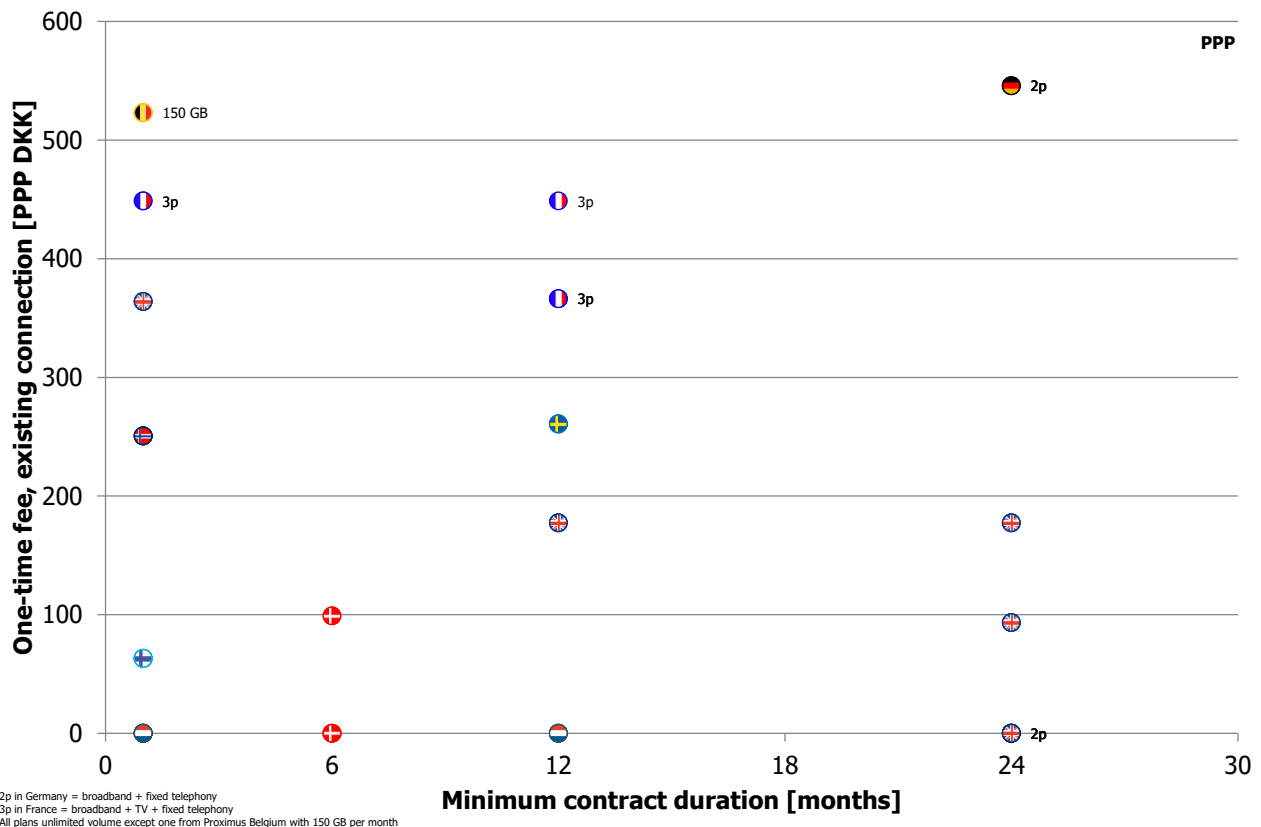


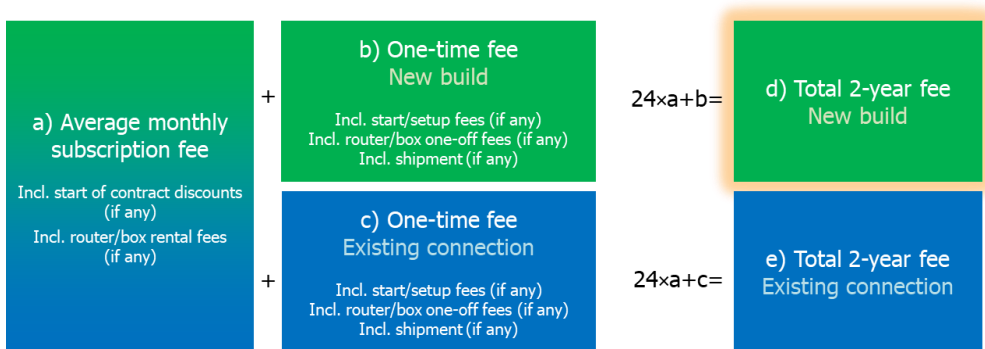
Figure 12. Comparison between one-time fees in PPP DKK for a new fibre customer on an existing connection to the minimum contract duration in nine countries, September 2023 [source: providers’ webpages and pricelists complemented by direct emails to providers when necessary, OECD].

Figure 12 shows no correlation between the one-time fees for an existing connection and the minimum contract period.

Among our nine countries, it is only **Denmark** that applies a 6-month binding period. The average binding period for existing connection cases at all our analysed countries and providers is **10.0 months**.

Denmark's minimum contract duration of 6 months is approximately 4 months shorter than the average of all countries. From our analysis it is hard to see that the minimum contract duration has any major impact on the one-time fees for existing connections.

9. Total 2-year fee – new build



With focus on connecting the unconnected, we are now adding the new build one-time fees to the monthly subscription fees for 24 months to get the *total* fee for a customer that decides to install fibre into a detached home and then subscribe to a broadband service for 24 months.

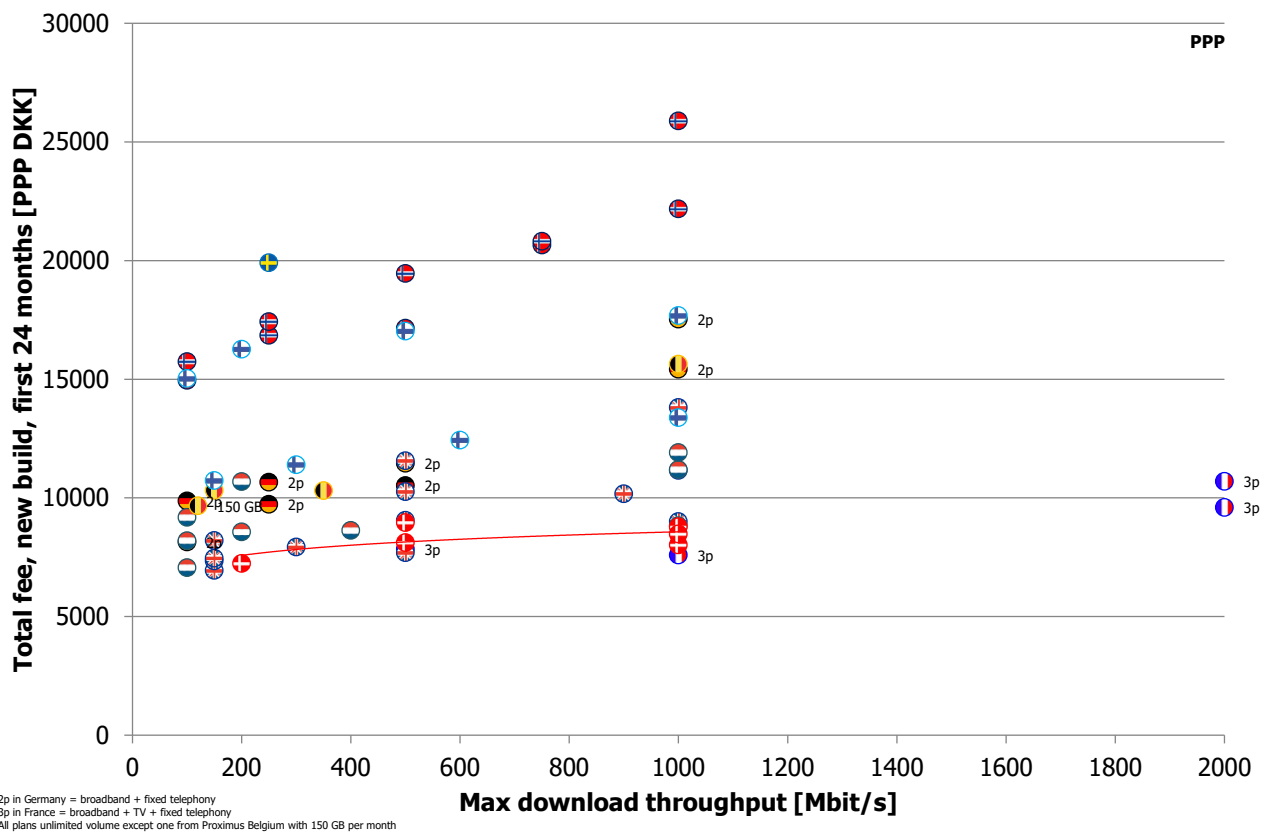


Figure 13. Comparison of the total new build fee in PPP DKK during the first 24 months to the max download throughput (up to 2000 Mbit/s) in nine countries, September 2023 [source: providers' webpages and pricelists complemented by direct emails to providers when necessary, OECD].

Figure 13 shows how the very high new build one-time fees in **Sweden** (upper left) affect the total cost for the first 24 months period. **Norway** doesn't have as high one-time fees as Sweden, but expensive monthly

subscriptions – which leads to Norway becoming the second most expensive market for new build fibre customers during a two-year period. **Finland** can be seen as the third most expensive although a few other countries mix in with some of the Finnish plans.

The remaining countries are more cluttered with **Denmark** positioned at the lower end of the scale alongside plans from the Netherlands and the UK. The only market generally operating with lower total 2-year fees than Denmark after adjusting for differences in purchasing power is **France**. The position of France is quite extreme if considering that the French providers deliver a full triple-play service – including large TV packages – for that money.

After purchasing power adjustment, the total 2-year new build fees for Danish fibre broadband are among the more affordable in our nine European markets. Only France is generally offering lower total fees.

Below a fact box on **France** to give some background to why the French fibre (or in their case rather triple-play) fees generally are so low²⁵.

France is one of the most competitive telecom markets in Europe with four fully fledged national integrated (i.e. fixed and mobile) operators – Orange, SFR, Bouygues and Free – offering both fixed and mobile services on their own networks.

Even since **Free** – today the second largest fixed broadband provider in France – launched its first 'Freebox' triple-play offer in 2002 for 29.99 EUR per month, the French market has been very price-centric. The competition followed Free into these low-price points.

Free's disruption continued when the company launched mobile services in 2012: The 19.99 EUR per month for an essentially unlimited proposition was much lower than current market pricing – and Free also offered a limited mobile subscription for just 2 EUR per month. That subscription was even free for those with a Freebox. In six years, Free reached close to 14 million mobile subscribers.

Member of the French telecom industry has many times mentioned that the market needs consolidation. Attempts to merge SFR and Bouygues – and Orange and Bouygues – have however failed. All providers are today reporting good profitability.

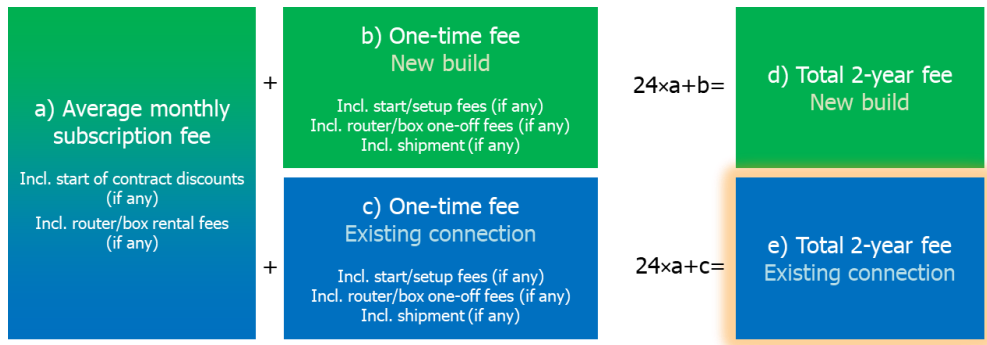
With Nordic standards, France was relatively late into fibre, but the network rollout has accelerated a lot and the fibre subscription base follows upwards. Consequently, investment levels in fixed networks have increased rapidly – while the share of investments going into mobile declined until 2022.

Although the French providers have built parallel fibre networks to some extent, they have had the freedom to engage in bilateral sharing agreements in areas of common interest. These agreements are not always between the same two providers; all providers mix with different partners in different areas.

As often in France, the government is involved in what happens: In 2013, the government launched the "France Très Haut Débit" plan with up to 3 billion EUR of government subsidy to support fast broadband development in all of France.

²⁵ Partly based on <https://www.arcep.fr/cartes-et-donnees/nos-publications-chiffrees/observatoire-des-marches-des-communications-electroniques-en-france/marche-des-communications-electroniques-en-france-annee-2019-resultats-definitifs.html> and <https://www.arcep.fr/demarches-et-services/collectivites/le-plan-france-tres-haut-debit-pfthd.html>

10. Total 2-year fee – existing connection



Finally, the total 2-year fee for a customer moving into a house with an **existing connection**. As mentioned in the end of section 7, a growing share of homes is already connected. The previous section made sense for the unconnected homes only – this section is for the connected homes.

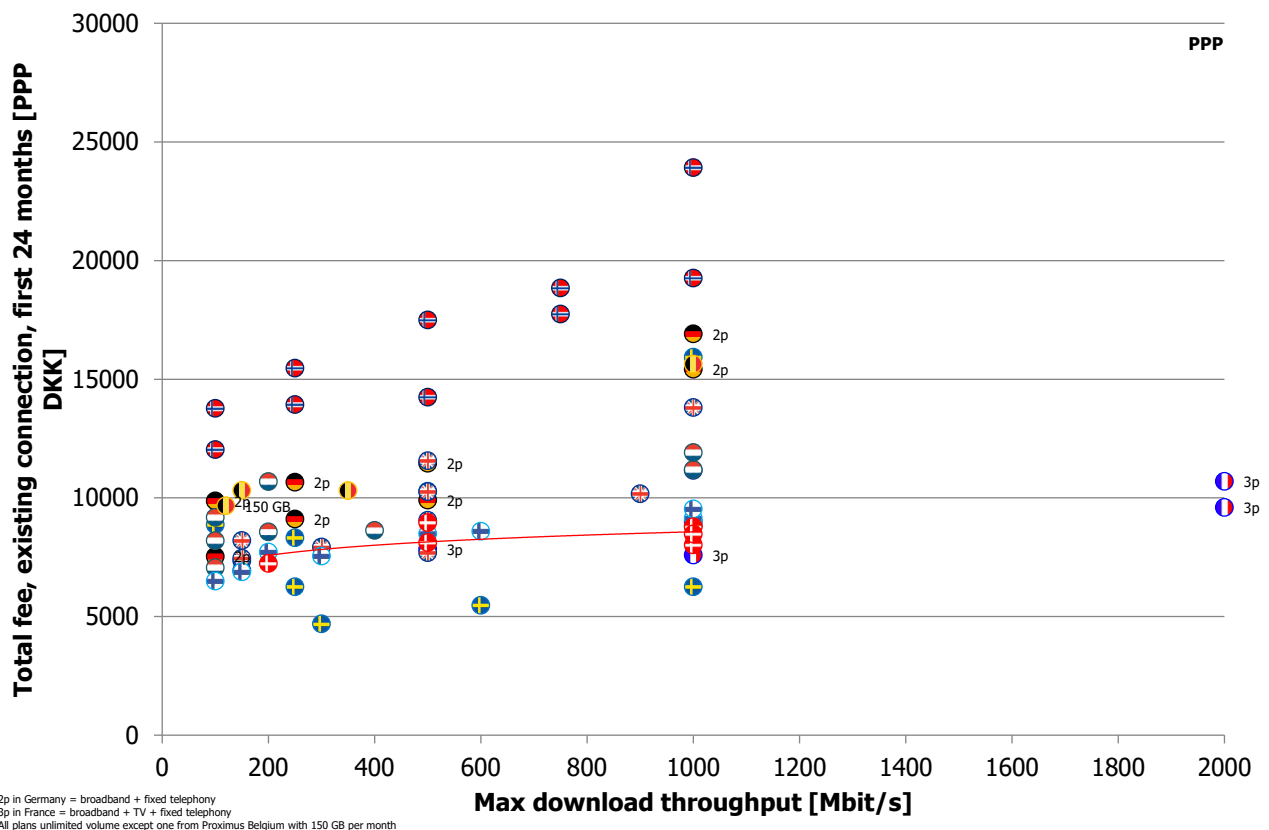


Figure 14. Comparison of the total fee for an existing connection in PPP DKK during the 24 months to the max download throughput (up to 2000 Mbit/s) in nine countries, September 2023 [source: providers' webpages and pricelists complemented by direct emails to providers when necessary, OECD].

With an existing connection, **Norwegian** total 2-year fees are the highest among our markets. **Belgium and Germany** share the position as second most expensive.

In section 6, we concluded that the Danish subscription fees were at the low end. In section 8, we concluded that the Danish one-time fees for existing connections also were at the low end. Since Figure 14 sums up the two, it's logical that the Danish total fees are reasonable in an international context. France is again Denmark's toughest competitor pricewise after adjustment for purchasing power – but there are also a few Swedish and Finnish options that can compete with Denmark.

After purchasing power adjustment, the total 2-year existing connection fees for Danish fibre broadband are among the more affordable in our nine European markets. Only France is generally offering lower total fees.

11. Development in 2-year fees from 2022 to 2023

Since this is an update of a similar [analysis done in 2022](#), it allows us to compare how the 2-year fees developed during the fourteen months between July 2022 to September 2023. The comparisons are done for the plans that have the same – or comparable²⁶ – throughput.

To make sure currency fluctuations are not behind the trends, the comparisons are done in local currency (LC) and, here, without adjustments for differences in purchasing power.

Let's first look at the total new build fee, see Figure 15 below.

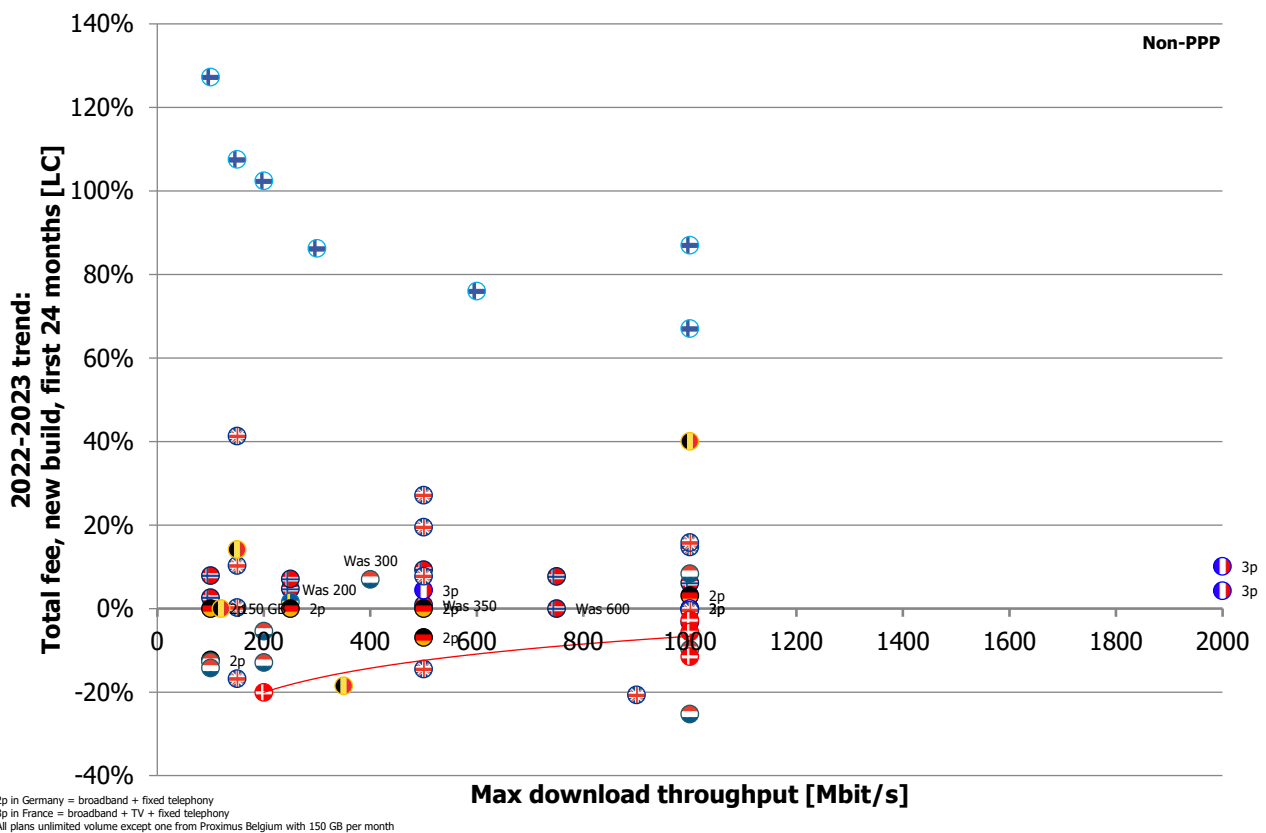


Figure 15. Comparison of the total new build fee in local currency during the 24 months to the max download throughput (up to 2000 Mbit/s) in nine countries, development from July 2022 to September 2023 [source: providers' webpages and pricelists complemented by direct emails to providers when necessary].

²⁶ The plans that are considered comparable although they are not identical are: One 1000/200 Mbit/s plan from YouSee (download/upload) which now is 1000/1000 Mbit/s. One 1000/1000 Mbit/s plan from Norlys which now is 1000/500. One 600/600 plan from Telenor which now is 750/750, one 350/350 which now is 500/500 and one 200/200 which now is 250/250 (these three are labelled in the figure as download throughput was changed). One 300/100 plan from Tele2 which now is 300/300. One 1000/500 Mbit/s plan from Vodafone which now is 1000/200 Mbit/s and one 500/250 which now is 500/100. One 300/300 Mbit/s plan from Caiway which now is 400/400 Mbit/s (also labelled in the figure). One 350/30 Mbit/s plan from Proximus which now is 350/50 Mbit/s. One 1000/400 Mbit/s plan from Elisa which now is 1000/1000 Mbit/s, one 600/200 which now is 600/600, one 300/100 which now is 300/300 and one 150/50 which now is 150/150.

The comparable base consists of 59 plans in total. Of these 32 (54%) became more expensive, 18 (31%) became less expensive and for the remaining 9 (15%) there was no change in the 2-year fee. The table below compares this development trend to the trend observed in the analysis of last year.

Trend: Total 2-year fee, new build [local currency]	June 2021 to July 2022	July 2022 to September 2023
More expensive	48%	54%
Less expensive	25%	31%
No change	28%	15%

Figure 16. Comparison of the development in 2-year fees for comparable new build cases [source: providers' webpages and pricelists complemented by direct emails to providers when necessary].

Last year, most plans (53%) were sold cheaper or for the same total 2-year fee compared to a year earlier. This time, it's 46%. It hence seems as if European providers in 2023 shifted gear towards higher fees. In the context of an increasing general inflation, this is a logical trend.

In some countries, particularly **Finland**, the 2-year fees for a new build rose significantly as shown in Figure 15. This is explained by providers today charging new build customers a one-off fee of 495 to 1090 EUR – where it last year was waived.

Albeit at a lower level of increase, some plans in the UK, Belgium and Sweden became 20-40% more expensive. The explanation in these cases is that the provider in question significantly cut back on the duration of the initial discount period – or made the initial discount lower. To give one example, Hyperoptic in the UK last year charged 22 GBP (for a 35 GBP 150 Mbit/s plan) during a 24-month binding period. That same plan is now charged 32 GBP per month during that 24-month binding period (and still 35 GBP thereafter).

In **Denmark**, four out of four (100%) comparable plans became less expensive. The only other market that seems to generally have moved towards lower 2-year fees is the **Netherlands**.

If comparing the total 2-year fees for an *existing* connection, the graph doesn't change much apart from Finland now being less of an outlier when the one-off fee for a new build no longer is included.

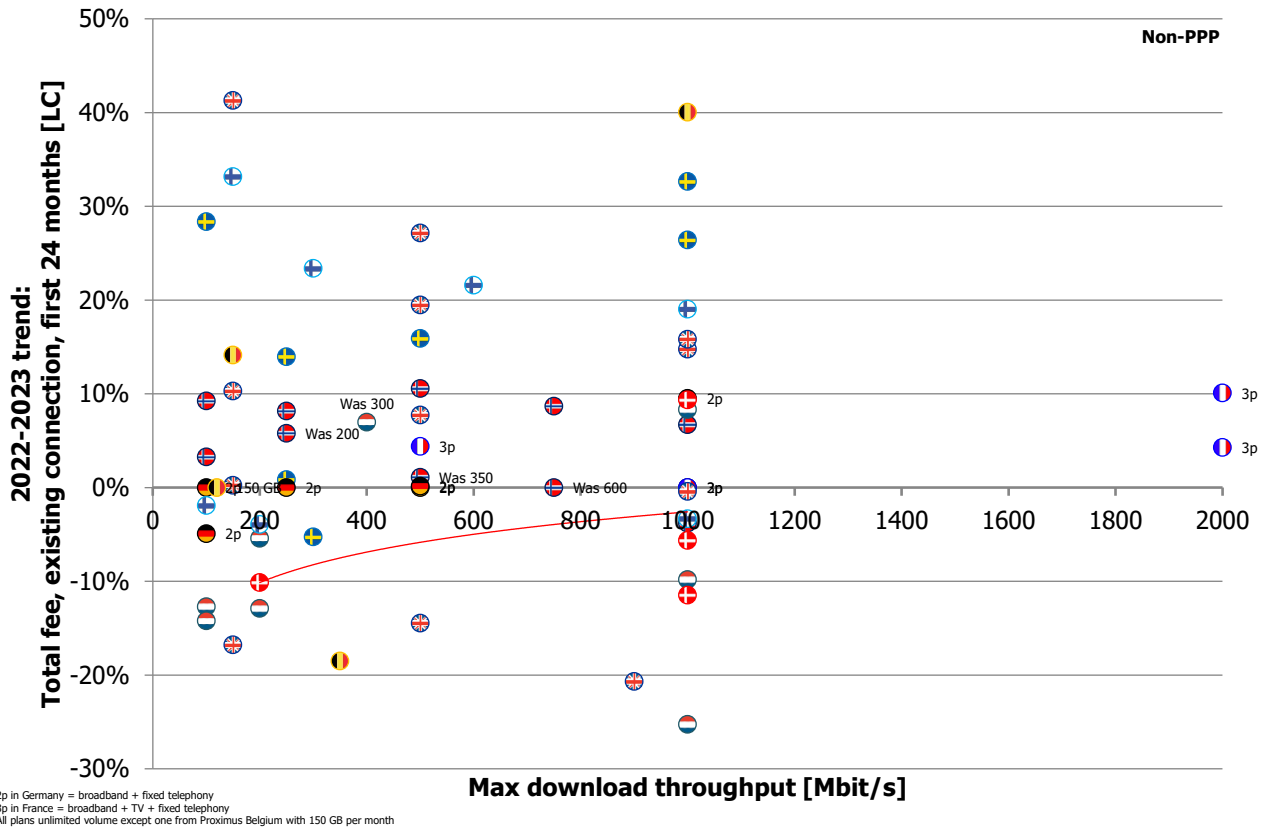


Figure 17. Comparison of the total fee for an existing connection in local currency during the 24 months to the max download throughput (up to 2000 Mbit/s) in eight countries, development from July 2022 to September 2023 [source: providers' webpages and pricelists complemented by direct emails to providers when necessary].

The comparable base consists of 65 plans in total. Of these 36 (55%) became more expensive, 20 (31%) became less expensive and for the remaining 9 (14%) there was no change in the 2-year fee. The table below compares this development trend to the trend observed in the analysis of last year.

Trend: Total 2-year fee, existing connection [local currency]	June 2021 to July 2022	July 2022 to September 2023
More expensive	46%	55%
Less expensive	26%	31%
No change	28%	14%

Figure 18. Comparison of the development in 2-year fees for comparable existing connection cases [source: providers' webpages and pricelists complemented by direct emails to providers when necessary].

Last year, most plans (54%) were sold cheaper or at the same total 2-year fee as a year earlier. This time, it's 45%. Similar to the new build comparison, it hence seems as if European providers in 2023 shifted gear towards higher fees. In the context of an increasing general inflation, this is, as said, logical.

In **Denmark**, three out of four (75%) comparable plans became less expensive. The only other market that seems to generally have moved towards lower 2-year fees is the **Netherlands**.

In the fourteen months between July 2022 and September 2023, 54-55% of comparable 2-year fees increased across the nine markets. 31% decreased and 14-15% didn't change. This represents an acceleration in price increases compared to the 2022 analysis. Two markets bucked the trend to instead develop towards lower 2-year fees: Denmark and the Netherlands.

It is important to remember that this analysis looks at **front book pricing**, i.e. prices that are available to new customers. As initially explained, providers will use different tactics, typically initial discount periods, to lower front book prices. Although we just observed a higher propensity for price increases in the front book prices, there might be a similar or stronger trend towards higher broadband prices for existing customers, i.e. increasing back book prices. This falls outside of the scope of this analysis.

12. Fixed broadband: Actual throughput

In the previous sections we have analysed pricing in depth. Let’s now compare the actual throughput that the median²⁷ fixed broadband customer get. This is again wider than just fibre broadband – also DSL technologies and hybrid fibre coax (HFC) broadband are included. Since fixed broadband almost exclusively is priced based on throughput, the median throughput is the result of two factors:

- What the broadband connections technically deliver.
- How much the customers have been willing to pay for their connections.

A hypothesis could be that the cheaper fibre broadband that exists in a market, the better the average throughput would be as more households could afford it.

For comparable data, we turn to Ookla Speedtest. Ookla uses crowdsourced data based on tests actively done by broadband users. The drawback is that we don’t know how representative these tests are. In addition, the throughput measured by these tests is affected by the throughput tier paid for by the customers.

With these words of caution, let’s compare the latest available median download throughput in our nine countries:

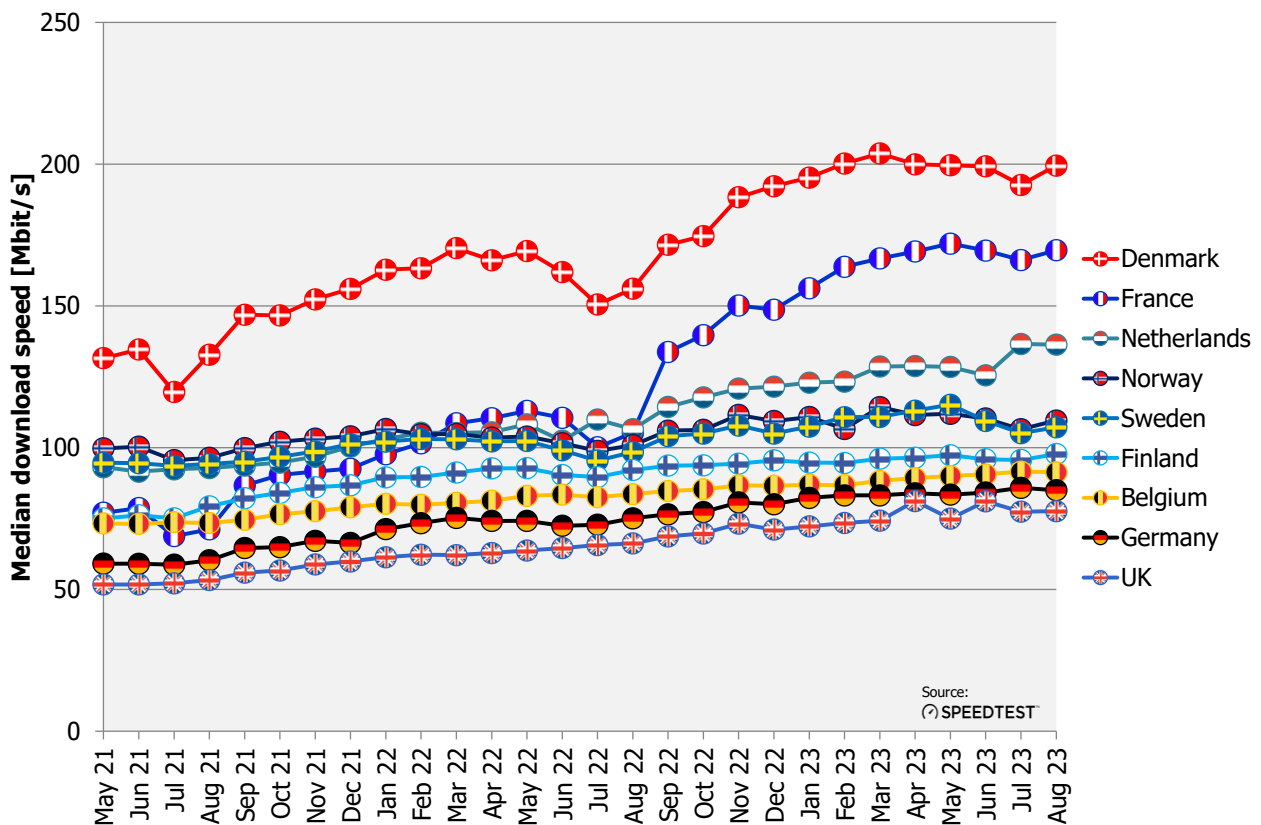


Figure 19. Median fixed broadband download speed per month May 2021-August 2023 per country [source: Ookla Speedtest]

²⁷ Ookla Speedtest have changed from average to median throughput as their primary metric.

Perhaps surprisingly – Denmark doesn't have the highest share of fibre subscriptions – it's **Denmark** where the median fixed broadband user has the highest download throughput. It has continued to increase year-on-year, see also the table below.

	Median fixed broadband download speed²⁸ August 2022	Median fixed broadband download speed August 2023	Year-on-year development
Denmark	156	200	+28%
France	105	170	+61%
Netherlands	107	136	+28%
Norway	101	110	+9%
Sweden	98	107	+9%
Finland	92	98	+6%
Belgium	84	91	+9%
Germany	75	85	+13%
UK	66	78	+17%

Figure 20. Development in median fixed broadband download speed August 2022-August 2023 [source: Ookla Speedtest]

A plausible explanation is that high download speeds – as shown in this analysis – are quite affordable in Denmark. There's still a large speed gap to second-placed France even though France has improved much in the past year. As we've seen, France has consistently been among the cheapest markets of our nine. Like Denmark, there's not much of a cost reason not to buy fast broadband.

The three countries with the lowest share of fixed broadband base in fibre also have the lowest average speeds: The UK, Germany and Belgium.

Denmark has the fixed broadband networks with the highest median throughput according to Ookla Speedtest data. As Denmark generally has low fibre broadband subscription fees, this could have contributed to a willingness to purchase higher speed subscriptions.

²⁸ Rounded to nearest integer.

13. Summary and conclusion

The extensive pricing research done for this analysis shows that Danish fibre broadband often, but not always, is **less expensive** than in the peer group countries. France is the only country that systematically have lower prices – after adjustment for purchasing power – than Denmark.

Denmark's low-price position is explained by:

- **Affordable** fibre broadband monthly subscriptions – alongside France, Finland and Sweden.
- **Very low** one-time fees for *new builds*, in line with the Netherlands and the UK – and significantly lower than in Sweden, Norway and Finland.
- One-time fees for *existing connections* in the **low range** of our international spectrum.

These characteristics result in Denmark having:

- **Among the more affordable** total 2-year fees for a new build fibre customer.
- **Among the more affordable** total 2-year fees for an existing connection fibre customer.

The favourable price position of Denmark comes even though Danish fibre broadband contracts have **minimum contract duration** of 6 months – about 3-4 months shorter than the average of all markets.

Since this is an update of similar analyses done in 2021 and 2022, it also examines how the fibre pricing developed from July 2022 to September 2023. During these fourteen months – for the nine markets analysed – 54-55%²⁹ of comparable 2-year fees increased, 31% decreased and 14-15% didn't change. This represents an acceleration in price increases compared to the 2022 analysis. Two markets bucked this trend to instead develop towards lower 2-year fees for new fibre customers: **Denmark and the Netherlands**.

Denmark is, according to Ookla Speedtest data, providing the **fastest median download experience** in its fixed broadband networks.

²⁹ Depending on if the new build or the existing connection case