

Denmark

	Denmark				EU
	DESI 2017	DESI 2018	DESI 2019		DESI 2019
	value	value	value	rank	value
1a1 Fixed broadband coverage	99%	99.5%	99.5%	10	97%
% households	2016	2017	2018		2018
1a2 Fixed broadband take-up	83%	86%	82%	8	77%
% households	2016	2017	2018		2018
1b1 4G coverage	97%	97%	99%	5	94%
% households (average of operators)	2016	2017	2018		2018
1b2 Mobile broadband take-up	120	128	131	5	96
Subscriptions per 100 people	2016	2017	2018		2018
1b3 5G readiness	NA	NA	33%	3	14%
Assigned spectrum as a % of total harmonised 5G spectrum			2018		2018
1c1 Fast broadband (NGA) coverage	93%	95%	95%	6	83%
% households	2016	2017	2018		2018
1c2 Fast broadband take-up	41%	52%	55%	8	41%
% households	2016	2017	2018		2018
1d1 Ultrafast broadband coverage	NA	86%	92%	4	60%
% households		2017	2018		2018
1d2 Ultrafast broadband take-up	11%	19%	28%	11	20%
% households	2016	2017	2018		2017
1e1 Broadband price index	89	86	86	13	87
Score (0 to 100)	2016	2017	2018		2017

1. Progress towards a gigabit society

On 17 May 2018, all political parties in the Danish Parliament agreed on a new political framework for the telecommunications industry. Among others, the agreement confirmed the national broadband target. According to this target, all homes and businesses should be covered by broadband speeds of minimum 100/30 Mbps downlink/uplink by 2020, and they should have good mobile coverage. In 2020 the parties will discuss whether the target would need to be updated.

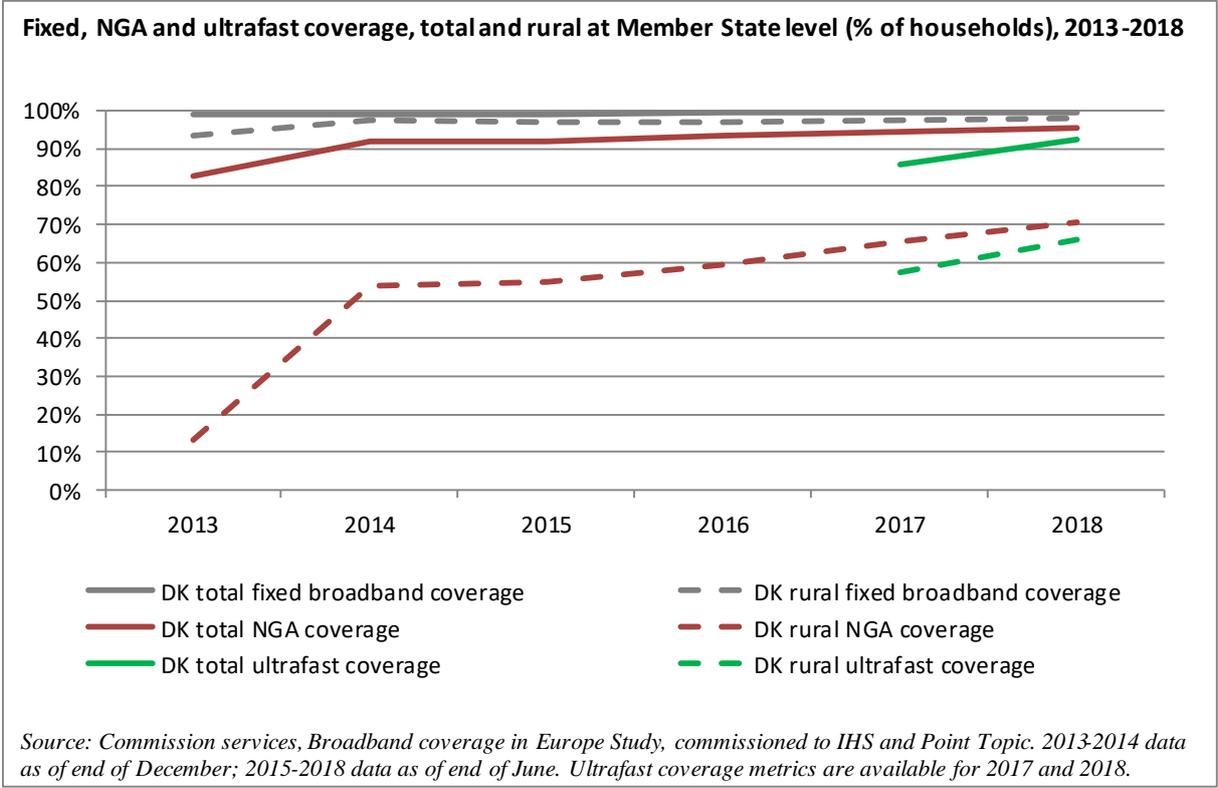
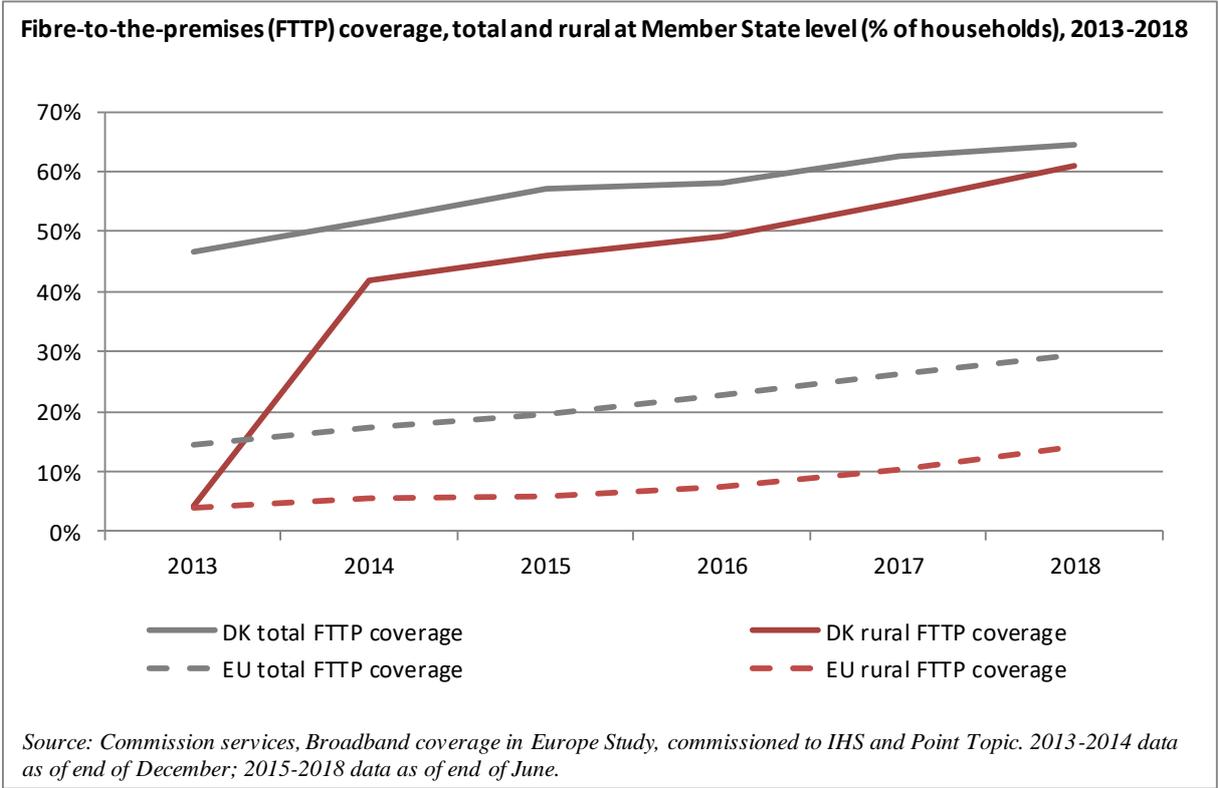
The political agreement confirmed the fundamental principle of the Danish telecom policy that the rollout of digital broadband is primarily done by the telecom sector on ordinary market terms. State aid should only be a possibility in local areas with poor prospects for better coverage by the market.

4G coverage is among the best in the EU (99 % of households). Both mobile and fixed broadband take-up have progressed.

In general, Denmark has a very good broadband coverage, including in rural areas. Ultrafast broadband coverage of 92 % of households is also well above the EU average (60 %). Total NGA coverage is among the best in the EU (95 %). Rural NGA coverage has improved, but with 70.6 % coverage these remote areas are still lagging considerably behind total NGA coverage. There are still some smaller white spots with poor coverage. Many of these white spots (but not all) are situated in rural areas. In parts of the country, local or regional (consumer-owned) energy utilities are rolling out high-speed broadband (fibre) to a large percentage of local addresses – including in many rural areas. Several of these utilities have announced their intention to cover all remaining shareholders in these areas (urban and rural) with high-speed broadband (in most cases fibre) within the next few years.

A number of small (and in most cases, local) providers of fixed wireless broadband are expanding their activities, typically in rural areas. Some of the providers are offering access to high-speed broadband with speeds of 100 Mbps or more. Thus, it is expected that most addresses in Denmark will

receive access to high-speed broadband through commercial rollout. However, it is recognised that there will be white spots (notably in rural areas), where the market probably will not be able to deliver rollout within a predictable future.



Two initiatives have been taken to support the rollout in such white spots. The National Broadband Fund, established in 2016 by the Danish government has focused more on

sparsely populated areas in 2018. The Fund had DKK 100 million for 2018. The same amount is approved for 2019. The Fund can offer grants for the rollout of high-speed broadband (minimum 100/30 Mbps downstream/upstream) in underserved areas (which have access to max 10/2 Mbps). The Fund targets local households and/or businesses aggregating their demand to apply for financial assistance collectively. Back in 2016-2017, the National Broadband Fund offered approx. DKK 180 million in grants to a total of 73 projects comprising some 7,600 addresses (homes, businesses and holiday homes).

In November 2018, the Danish Parliament adopted a proposal to amend the Telecommunications Act in order to establish a more concise framework for state-aid from municipalities to support the local rollout of digital infrastructure. The Danish Energy Agency (DEA) has been commissioned to prepare one or more state aid schemes, which will be presented to the Commission for approval.

The major challenge is the mapping of the addresses that can obtain better coverage through projects supported by the National Broadband Fund. Denmark has a very detailed mapping of broadband coverage at address level. However, this is very demanding in terms of manpower each year for the Danish Energy Agency (DEA), in order to ensure that grants are only provided for addresses with very poor coverage (max 10/2 Mbps). Some operators also decline to participate in the grant projects for another reason, namely because in their view the rules for open access are too much of an administrative burden. This is in particular an issue because the projects are typically quite small (50-100 addresses, or even fewer). Accordingly, in some parts of Denmark it is more difficult to organise local projects to apply for a grant from the National Broadband Fund.

The high degree of digitisation of the Danish society and the low level of prices are contributing factors to the high take-up of broadband.

WiFi4EU is criticised by mobile network operators (MNOs) as putting their business case under threat. The option to set usage limitations corresponding to the wording in the WiFi4EU Regulation if the competition in the market is negatively affected had been introduced into national legislation at the end of 2017, but had not yet been applied.

Denmark has started preparations for the transposition of the European Electronic Communications Code (EECC). The project team for the overall implementation process has been put together to coordinate specific input to the legislative process. It has started to analyse central access provisions, including symmetric access, wholesale-only and co-investment, with stakeholder meetings and desk-research on the schemes in other EU countries. The aim is to transpose the Code in as open a process as possible. According to the approved timetable it is expected, that the legislative measures necessary for the implementation will be presented to parliament in the second half of 2020.

2. Market developments

Competitive environment

Since 2014 the telecommunications market has been constantly decreasing in terms of turnover, while investment is increasing. According to the DEA, investments by the telecommunications companies are up from DKK 6.6 billion in 2016 to DKK 7.3 billion in 2017, which represents an increase of 10.3 %. Investments have been on the rise since 2013. From 2014, the total turnover has decreased, thus contributing to an increase in the investment rate from 17.4 % in 2016 to 19.3 % in 2017.¹

The incumbent, TDC, which operates the nationwide telecommunications network, the coax cable TV network (serving approximately 50 % of Danish households) and one of the four mobile networks, has

¹ The DEA issued its publication on economic key figures for the telecommunications sector for 2017 in July 2018.

been taken over by Danish pension funds and an Australian investment fund. In February 2018 DK Telekommunikation – acting on behalf of Macquarie and three Danish pension funds, namely PFA, ATP and PKA – bought TDC for about USD 6.7 billion. Macquarie on the one hand and the three pension funds on the other respectively own 50 % of the shares. In July, the new owners sold GET, a TDC-owned cable TV company in Norway, thereafter focusing solely on activities in Denmark. They announced their intention to focus on long term returns with low risk. They are considering restructuring the company to structurally separate retail and wholesale businesses, with a possible subsequent full divestiture of the retail arm. A network-focused unit, so far called NetCo, is intended to operate all infrastructure – both landline and mobile. The focus here will be on expanding infrastructure in Denmark available to service providers (including OpCo). A customer-focused division, at the time called OpCo, but later expected to be renamed Nuuday, is intended to manage the retail business with both private and corporate customers, with a focus on innovation, digital services and customer experiences. The CEO of TDC resigned in early December 2018 in the context of these changes.

In May 2018, TDC (with its brands Yousee and Dansk Kabel-TV) was estimated to have 1.28 million TV subscribers (down by 50 000 since June 2017) and 1.28 million broadband subscribers in 1H 2018. TDC is still the biggest player in Denmark in all four markets (status May/June 2018): in mobile telephony it had 40 % market share, in fixed telephony 65 %, in TV 56 % and in broadband connections 50 % – without the 47,000 Hiper subscribers. The main brands used by TDC are: YouSee, Telmore, Fullrate, Blockbuster and Dansk Kabel-TV.

2.1. Fixed markets

Fixed subscriptions (VoIP, PSTN and ISDN) continue to decrease or stagnate. VoIP remains at approximately 887,000 in 1H 2017 and 1H 2018, and PSTN and ISDN subscriptions fell to 396,000 and 25,000 respectively. Accordingly PSTN and ISDN subscriptions declined by 24.7 % and 36,3 % from 1H 2016 to 1H 2018 (12.5 % and 19,9 % from 1H17 to 1H18 alone).

Syd Energi (SE) and Eniig, two of the regional energy companies which are also FTTH providers, announced a merger in October 2018. They intend to work in the future under the name Norlys. The merger is subject to the approval of the Danish national competition authority (NCA) Konkurrencerådet – part of the Danish Competition and Consumer Authority. After the consolidation, Norlys is estimated to have approximately 709,000 shareholders (this also means customers getting their power supply from Norlys) and more than a million households subscribing to TV and broadband via either fibre or coax (42 % of all households). Geographically, Norlys will cover about 40 % of Denmark.

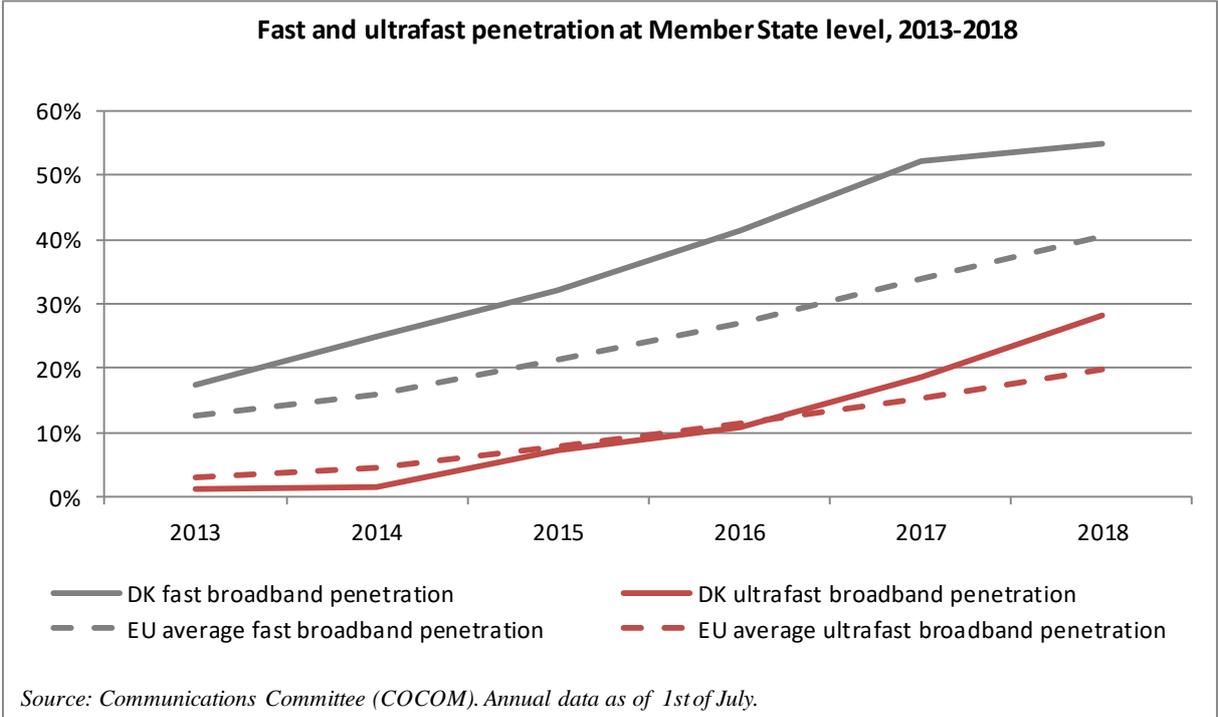
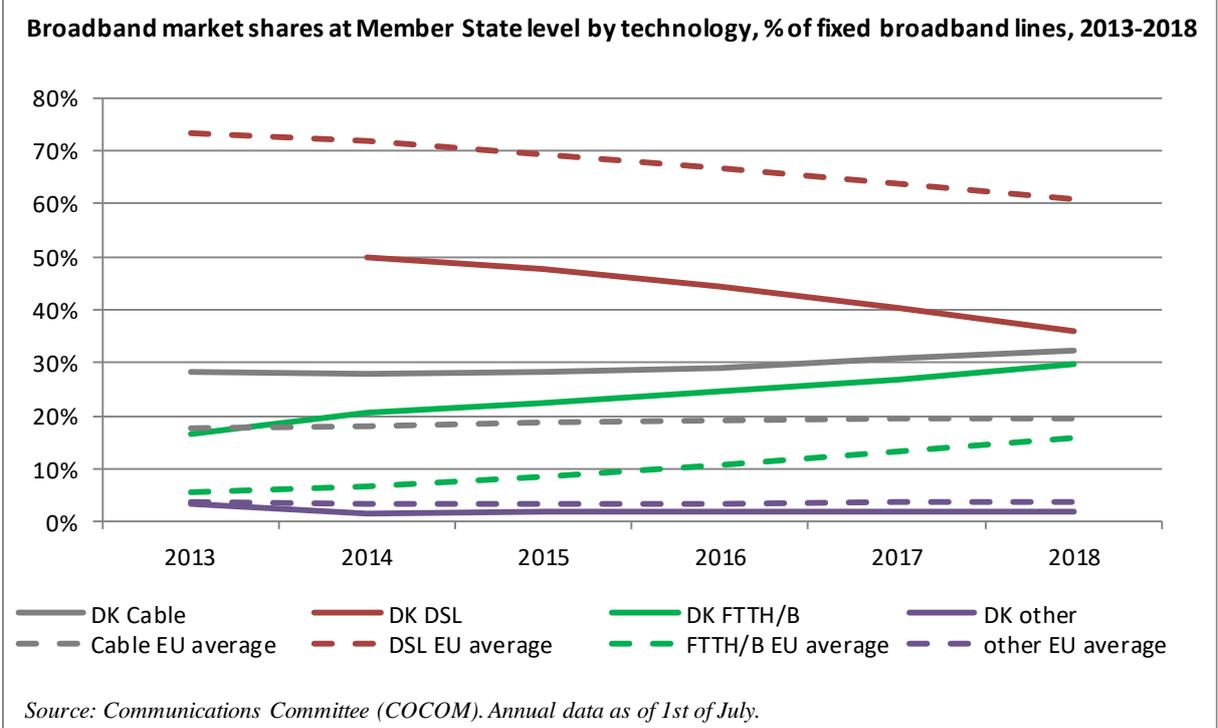
Norlys announced that the ‘OpenNet’ platform, intended to enable third party fibre access, will continue to function as an independent company with the aim of opening utility companies’ fibre networks to strengthen the digitalisation of Denmark.

Later in October 2018, TDC announced that it had bought the company Hiper, a service provider selling broadband connections using TDC’s fixed network infrastructure (copper, fibre and coax). Hiper had reached 47,000 customers. Due to the limited volume of the deal, it does not need approval from the NCA.

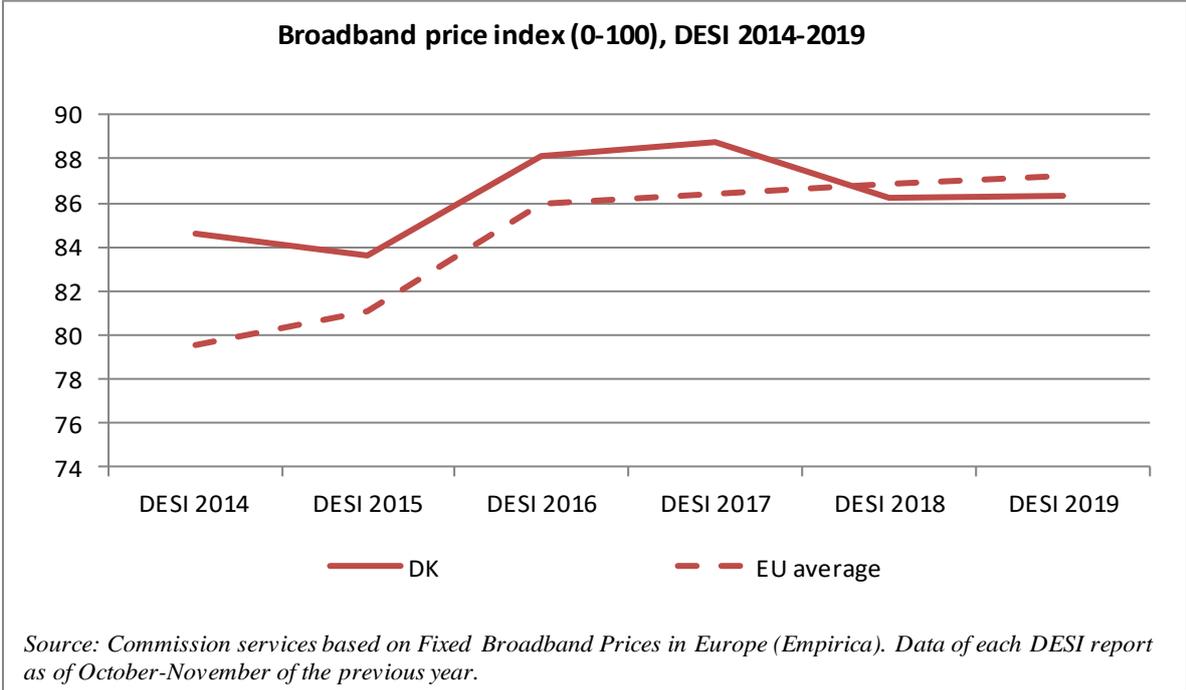
In Denmark there are currently eight utility companies functioning as wholesale-only operators. However, two are partly owned by larger corporate groups that have retail-level activities, and one owns a stake in a larger corporate group that has retail-level activities. All these companies taken together cover only a small, sparsely populated part of Denmark, meaning they have little geographical reach and the impact on overall competition is also very limited.

Between 1H 2017 and 1H 2018 fixed broadband subscribers in Denmark continued migrating to higher bandwidths and replacing DSL subscriptions by fixed broadband subscriptions based on fibre (+2.9 percentage points of market share) and on coax cable (+1.5 percentage points of market share).

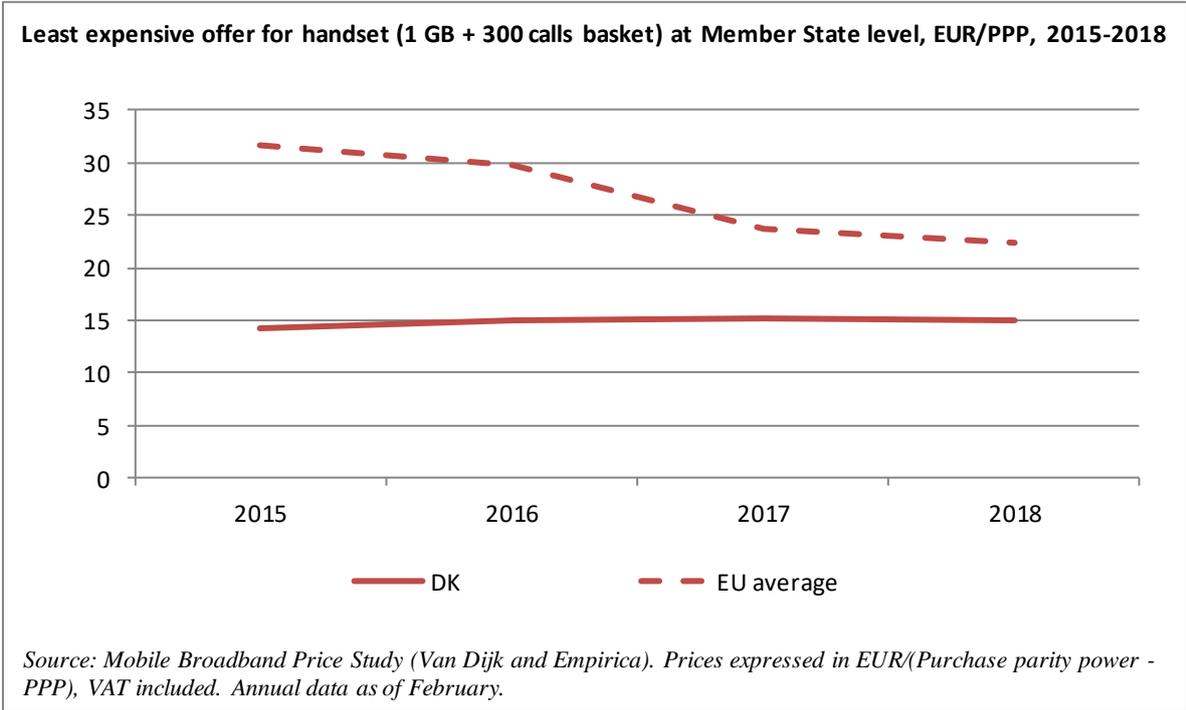
Fixed broadband take-up has progressed, in particular in ultrafast broadband, where there was a sharp increase in take-up from 19 % of fixed broadband lines in 2017 to 28 % in 2018. 9 % of Danish households subscribed in 2018 for the first time to ultrafast broadband. However, there are still 58 % of Danish households that could access ultrafast broadband, but so far did not choose to.



Denmark scores in the midfield at the broadband price index², its prices calculated using purchasing power parity (PPP) being slightly higher than the EU average.



2.2. Mobile markets



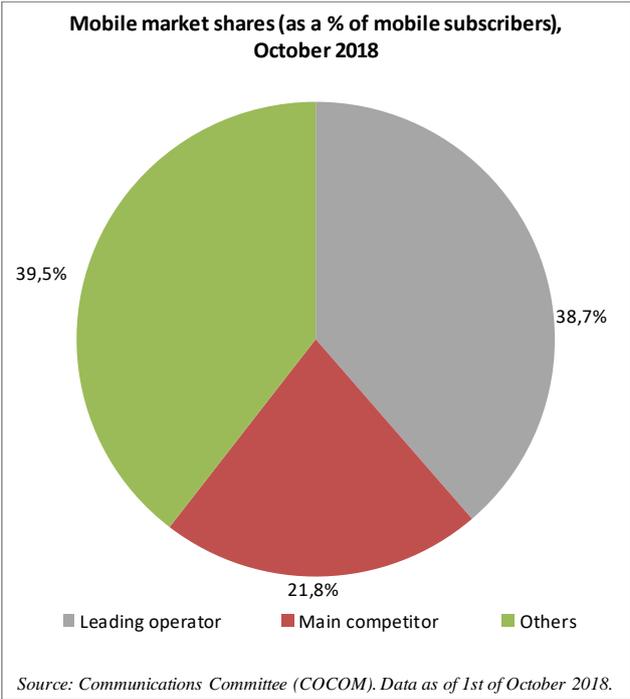
Data traffic volumes have increased by 36.8 % from 367,850 Terabyte (TB) in 2016 to 503,218 TB in 2017. Mobile call volumes (in terms of calls originated) decreased slightly by 0.3 % from 2016 to

² The fixed broadband price index weighs the cheapest retail offers from: standalone, double play (BB + TV, BB + fixed telephony) and triple play (BB+TV+fixed telephony) and three speeds categories - 12-30 Mbps, 30-100 Mbps and +100 Mbps. This indicator presents values from 0 to 100 (which should not be read as prices) and the higher the values, the better the country performs in terms of affordability of prices relative to purchasing power.

2017 to around 13.5 billion minutes. SMS volumes continue to decline. From 2016 to 2017, SMS communication fell by 9.9 % from 6.4 billion units to around 5.8 billion.

The number of mobile subscriptions remained almost stable (down by 0.1 % from the second half of 2016 to the second half of 2017). Due to a growing population, the number of subscriptions per 100 citizens dropped by 0.6 % between the end of 2016 and the end of 2017. At the end of 2017 there were 144.2 mobile subscriptions per 100 citizens in Denmark.

Mobile broadband prices for handset offers have not changed significantly in the past year -and are even below the EU average.



According to the DEA’s estimates, most Danish mobile subscriptions are in the form of bundles with minutes, SMS, MMS and data included for a single tariff. High usage bundles are offered with both unlimited minutes, SMS/MMS and unlimited data. The majority of mobile bundled offers include a limited amount of data to be used for roam like at home (RLAH). The amount of the data which can be used for RLAH is a selling point. It appears that the companies are now reducing the number of their bundled offers. Bundles including over the top (OTT) services like film and music streaming services also exist.

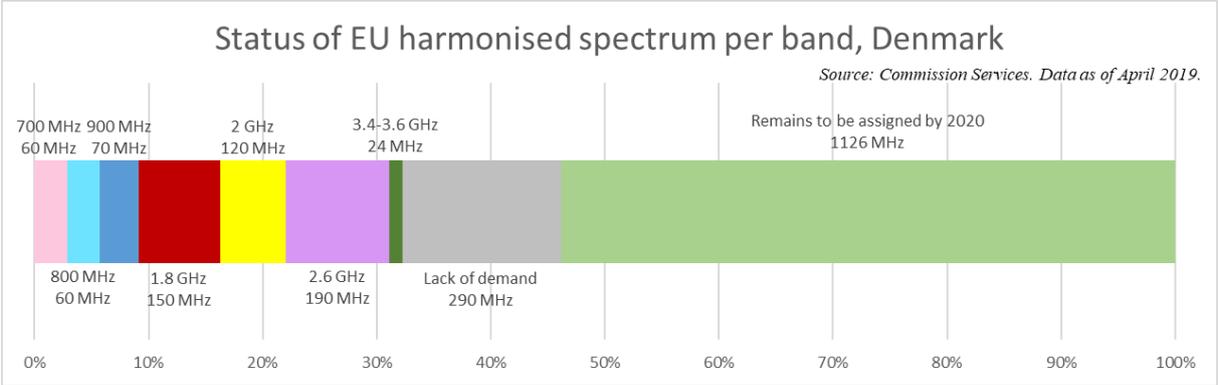
OTT services generate significant traffic in the mobile networks. Some OTT services also generate a substantial revenue. This is the case for Netflix, Spotify, HBO, etc. This forces

operators to include their own equivalent services or third party OTT services in their service offers. However, the DEA has no specific information about this.

On 1 October 2018, the mobile market share of the leading operator was 38.7 %, the market share of the main competitor was 21.8 % and the market share of all other operators was 39.5 %.

3. Regulatory developments

3.1. Spectrum



In Denmark, 32 % of the spectrum harmonised at EU level for wireless broadband has been assigned³. This relatively low percentage is mainly due to the lack of a procedure for assigning the the 1.5 GHz, the 3.4-3.6 GHz and the 26 GHz bands.

Three participants took part in the auction for the assignment of spectrum in the 700 MHz, 900 MHz and 2.3 GHz spectrum bands, that started on 19 February 2019. As Telia and Telenor have a network sharing agreement, they had to participate as one entity in the auction. The other two participants were the MNOs TDC and Hi3G. The auction had originally been scheduled for September 2018 but had been postponed by DEA on the eve of the starting day for unspecified reasons. On 17 December 2018, DEA communicated publicly that the auction would start in February 2019⁴. The terms, procedures and participants remained unchanged: the frequencies in the 700 MHz band to be awarded comprised 2x30 MHz paired frequencies (703-733 MHz paired with 758-788 MHz) and 20 MHz unpaired frequencies (738-758 MHz). The frequencies in the 900 MHz band comprised 2x30 MHz paired frequencies (880.0-891.9 MHz and 896.9-915.0 MHz paired with 925.0-936.9 MHz and 941.9-960.0 MHz respectively). The frequencies in the 2300 MHz band comprised 100 MHz unpaired frequencies (2300.0-2400.0 MHz). The auction ended on 28 March 2019. Hi3G acquired 2x10 MHz in the 700 MHz band and 2x10 MHz in the 900 MHz band. TDC acquired 2x15 MHz and 20 MHz for supplementary downlink in the 700 MHz band, 2x10 MHz in the 900 MHz band and 60 MHz in the 2.3 GHz band, the latter with no coverage obligations. The joint entity formed by Telia and Telenor acquired 2x5 MHz in the 700 MHz band and 2x10 MHz in the 900 MHz band⁵ The remaining 40 MHz of the 2.3 GHz band were not acquired. The way forward with regard to this spectrum is currently under consideration.

As to the coverage obligations in the 700 MHz and 900 MHz bands, the coverage areas are divided into three non-overlapping coverage area groups equally distributed throughout Denmark. By 4 April 2022, licensees must ensure provision of an outdoor mobile voice service and a mobile broadband service with a download bit rate of at least 30 Mbit/s and an upload bit rate of at least 3 Mbit/s. The coverage obligation applies in the coverage areas allocated in the auction process and specified in the licence, and at least 90 % of each individual coverage area must be covered.

All coverage obligations may also be fulfilled via national roaming agreements. Usage conditions also apply, over and above, the coverage obligations. Antennas and transmitting and receiving equipment capable of using the frequencies specified in the licence must be installed by the licensees no later than 4 April 2022 at a minimum of 100 mast positions⁶. The usage conditions apply to both the 700 and 900 MHz licences and the 2.3 GHz licence. The MNOs are expected to use any additional spectrum acquired first and foremost to provide additional capacity to mobile communication subscribers.

5G trials and tests are limited in scope and focus on the health sector, pharmaceuticals, agriculture and broadcasting.

A public consultation on interest in the market for the 3.6 and 26 GHz bands has been held in August 2018. A decision on the licence regimes for these bands is expected to be taken in 2019. It is specified

³ The 5G spectrum readiness indicator is based on the amount of spectrum already assigned and available for use for 5G by 2020 within the '5G pioneer bands' in each EU Member State. For the 3.4-3.8 band this means that only licences aligned with the technical conditions annexed to Commission Decision (EU) 2019/235, are considered 5G-ready. On the contrary, the percentage of harmonised spectrum takes into account all assignments in all harmonised bands for electronic communications services (including 5G pioneer bands), even if this does not meet the conditions of the 5G readiness indicator.

⁴ The auction started on 19 February 2019.

⁵ See <https://presse.ens.dk/pressreleases/flere-steder-i-landet-kan-se-frem-til-bedre-mobildaekning-2853575>

⁶ For further detail see <https://ens.dk/en/our-responsibilities/spectrum/auctions> and https://ens.dk/sites/ens.dk/files/Tele/information_memorandum_-_updated_feb_2019.pdf

that the assignment method is expected to be an auction. The award procedure and authorisation of the use of the relevant spectrum is planned to be carried out in 2020 to comply with the deadline specified in the EECC. Assigning sufficiently large blocks in the 3.6 GHz band is expected to be fairly straightforward as the existing users (all with time limited licences) will have vacated the band before the deadline. The DEA has not yet decided how to make space in the 26 GHz band for 5G services, but will work further to allow the use of at least 1 GHz of the band by 31 December 2020.

The DEA does not have to authorise base stations used in mobile networks on a case-by-case basis. Base stations can be established as the operators wish as long as they comply with the conditions in their spectrum licence. Macro base stations, mini base stations, pico cells and small cells can be used as the operators wish. Hence, there is no specific authorisation required for the deployment of small cells, but a municipal building or digging permit or an agreement with the owner of a building or structure may be needed.

3.2. Regulated access

In April 2018, the DBA adopted a supplementary price decision which became effective on 1 July 2018. This was a decision regarding fixed, fibre networks in Denmark for the year 2018. The DBA updated the long run average incremental cost (LRAIC) model used to determine the regulated rates for the provision of wholesale local and central access services by the operator TDC. TDC was found to have significant market power (SMP) in the DBA's 2017 market analysis. The adjustment of the model takes into account the fact that TDC is no longer obliged to provide network access to its fibre network in 56 geographically defined areas. The updated model has got a geographical dimension and is hence able to calculate separately the costs associated to TDC's fibre network in the regulated areas of the country (or in other areas if necessary)..

In June 2018 the DBA adopted a decision regarding the withdrawal of regulations on the retail market for access to the public telephone network at a fixed location for residential and non-residential customers (market 1, cf. Commission Recommendation of 17 December 2007). It will enter into force in June 2019.

Also in June 2018, the DBA adopted a decision regarding the withdrawal of regulations on the wholesale market for call origination on the public telephone network provided at a fixed location (market 2, cf. Commission Recommendation of 17 December 2007). It will enter into force in June 2019.

DBA reviews the cost calculations and sets the wholesale prices on an annual basis. In December 2018, the DBA updated the cost model for prices of wholesale services provided on fixed networks for 2019 in Denmark⁷. The review includes updating a number of the model's parameters, i.a. the number of active lines, broadband traffic, and the weighted average cost of capital (WACC). Apart from updating the inputs, the DBA calculated the WACC parameters using the same underlying approach as in previous years. According to the DBA, wholesale prices have increased compared to last year, mainly as a result of a decline in the number of active lines.

Finally, also in December 2018, the DBA updated the price caps for mobile termination rates (MTRs) for 2019. The DBA sets the new MTRs, valid from 1 January 2019, at DKK 0.0385 per minute (approx. 0.52 euro cent, down from 0.60 euro cent, comparing to the EU weighted average of 0.85 euro cent per minute⁸). Only five SMP operators received a decision (as opposed to the six identified in the market review) as the company Mundio (Vectone) had closed down.

⁷ The DBA issued a new price decision 27th February 2019 valid from 1st April 2019. This new price decision was issued due to a correction of the LRAIC-model.

⁸ BoR (18) 218, Berec report on Termination rates at European level, July 2018.

The DBA is starting to prepare for its 2020 market analysis of broadband markets (markets 3a and 3b)⁹. While utilities have again announced that they will open up their fibre networks voluntarily, this has not yet materialised. One utility, Eniig has introduced and invested in a wholesale platform, OpenNet, with the aim of enabling third party fibre access. Because of the small size of some of the utility companies, technical and administrative challenges are significant and access might have to be limited to bitstream access in some cases to ensure proportionality. So far, no utility companies have yet effectively opened up their fibre networks.

The DBA does not have explicit plans to revise the FTR and MTR models, due to the harmonisation of termination rates as set out by the Commission. The euro rate for both markets will be in place from 2021 according to the DBA's planning, which means that the DBA would not have a model ready before then.

For FTRs, the DBA implemented pure long run incremental cost (LRIC) as pricing methodology as of 1 January 2013 as laid down by the recommendation on termination rates from 2009. The FTR applies symmetrically to all 38 SMP operators in Denmark, is applicable from 1 January 2019, and will remain valid until the DBA adopts a new price decision. There has been no change to the pricing methodology since 1 January 2013. Volumes of terminating minutes in the fixed network have been declining year-on-year since 2012. The FTR price has been stable since 2015.

In 2008, the DBA began using LRAIC to regulate MTR, and implemented pure LRIC in 2012 as provided by the recommendation on termination rates from 2009. Since 2011 and until 2018 all MTRs have applied symmetrically to the six regulated mobile operators (four MNOs and two MVNOs). Only the latest data show a slight increase in the volumes of terminated minutes, but overall terminating minutes are stable. DBA is not aware of an intention by operators to move towards bill-and-keep. The MTR price has been decreasing each year since 2011.

As regards take-up of access products and new, NGA-related products (status: 1 July 2018) there is nothing to report for duct access. However, for dark fibre on market 3a, all companies taken together use approximately 615,400 lines. In local loop unbundling on market 3a, approximately 1.21 million lines from TDC are in use. VULA products from TDC in market 3b are used on 65,782 lines and on another 58,755 lines bitstream products are used. For dual pair bonding there is a total take-up of 31,200 connections. The DBA does no specific registration on the take-up of VULA products over copper lines which are upgraded with vectoring. For dark fibre, there has been an uptake of 52,312 new connections since 1 July 2017 (status: 01 July 2018). The total take-up of virtual fibre bitstream access (BSA) is 31,961 connections, while for fibre drop cables there is nothing to report. Coax bitstream access is not regulated.

DBA made a decision in one case regarding a price squeeze on TDC's flagship product for fibre bitstream access (FttH 50 Mbit/s). TDC was required to fulfil its price squeeze obligations on market 3a and 3b. TDC took the decision to the Danish Telecommunications Board of Appeal, where the decision later was upheld in December 2018.

The DEA maintains a database of future radio coverage plans and existing and planned antenna positions. The Danish Road Directorate provides a web service map where network operators can publish planned civil works. The Danish Telecommunications Industry Association maintains a database from which interested telecommunications companies automatically receive notification with offers of joint digging efforts from other telecommunications companies digging in certain areas. There is an agreement to coordinate on civil engineering works between telecommunications

⁹ Due to competitiveness of the business market, DBA had deregulated the wholesale market for high quality access provided at a fixed location in Denmark as of 6 September 2017.

operators. The Danish Register of Underground Cable Owners (LER) has a microsite ‘Graveinfo’ (‘Digging info’) that shows digging information on a map based on queries. LER is being further developed to better support the coordination of civil works and in the future also to better support the joint utilisation of physical infrastructure.

If regulated, DBA expects that the price setting related to access to and coordination of civil works will be challenging..

4. End-user matters

In 2017 the Telecommunications Complaint Board received 612 complaints. As to overall market performance from a consumer perspective, in Denmark the market for Internet provision ranks 22nd out of the 25 service markets assessed, 1.6 points lower with respect to the market’s EU average score¹⁰. The mobile telephony ranks 21st out of 25 services markets assessed, 1.7 points lower than the EU average score.

a. Net neutrality

The DEA has opened in one case an investigation on a potential breach of the Net Neutrality Regulation. The case is still pending. The DEA has not been confronted with any new specialised services¹¹. The DEA has received several general operator statements that there are issues relating to primarily 5G network slicing and the rules on specialised services. However, it has not received any concrete examples of incompatibilities in this respect.

b. Roaming

Roaming usage (data and calls) has increased considerably compared to the situation prior to the introduction of roam like at home (RLAH). End-users with subscriptions in Denmark consumed twice the roaming data and 15 % more call minutes in Q4 2017 (under RLAH rules) than they did in Q4 2016 (before the introduction of RLAH). For the subsequent three-month period the figures are largely similar: End-users with subscriptions in Denmark consumed 2.2 times more roaming data and 16 % more call minutes in Q1 2018 (under RLAH rules) than in Q1 2017 (before the introduction of RLAH).¹²

The DEA has made one decision relating to non-compliance with the RLAH rules. The case originated from August 2017 but the lack of response from the operator meant the final decision was taken on 15 June 2018. Due to the lack of response and failure to comply with the final decision, the DEA sent an enforcement notice to the operator on 28 August 2018. Subsequently the operator made changes to its fair use policy on 13 September 2018. The DEA finally found the fair use policy compliant with the DEA’s decision and the Roaming Regulation. Contrary to the mobile price trends in 2017, the DEA found no increases in domestic mobile prices in 2018. However, the amount of mobile services has been increasing, in particular for higher data allowances included in the subscriptions.

c. Emergency communications - 112

112 is the single emergency number in Denmark. 1.44 million calls were made to 112 in 2018. The average response time was 7 seconds and 80 % of the calls were answered within 10 seconds. The Danish emergency services provide an app that uses the GPS (if available) in the handset. This

¹⁰ The market performance index (MPI) is a composite indicator ranging from 0 to 100 which measures how well a given market performs according to consumers. See Consumer Markets Scoreboard 2018, available at https://ec.europa.eu/info/files/consumer-markets-scoreboard-making-markets-work-consumers_en

¹¹ See also Net Neutrality Report by Bird&Bird&Ecorys, 2019, forthcoming.

¹² See ‘International Roaming BEREC Benchmark Data Report October 2017 - March 2018’ available at https://berec.europa.eu/eng/document_register/subject_matter/berec/reports/8251-international-roaming-berec-benchmark-data-report-october-2017-march-2018

location data is transmitted to the public safety answering point by an SMS from the handset. It is under discussion between the operators and the DEA whether the mobile service providers could charge the end-user for these SMSs if their subscription does not include SMS flat rates.

The Ministry of Justice is in charge of implementing Advanced Mobile Location (AML) in Denmark.

Two different public warning systems are deployed in Denmark: Sirens and a special app¹³.

5. Institutional issues

Legislation for assigning numbering resources to public authorities and companies which use M2M communication in the execution of their tasks was passed in 2018. The purpose is to ensure that such public authorities and companies can switch operator without changing SIM cards and ensure competition in the market by avoiding lock-in effects.

6. Conclusion

Fixed broadband and mobile network coverage are significantly above the EU average. As Denmark overwhelmingly relies on private investment, upcoming decisions about regulated access to fibre networks resulting from the market reviews under preparation will be significant for investors to assess potential benefits and risks.

¹³ See Communications Committee, Working Document: “Implementation of the single European emergency number 112”, available at https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=57406