Source: unsplash.com

VATM in Denmark

Contribution to the comparison between the German and Danish markets

Outline of some of the factors that have affected market development in Denmark

Thomas Wimmer, MSc.

Copenhagen, June 17th, 2024

More than just Experts

About SBR-net Consulting AG

SBR-net Consulting AG

The consulting firm, headquartered in Vienna and Düsseldorf, provides counsel on broadband and fiber network rollout, telecom product and services, digitalization, mobile communications from a regulatory, technical and economic perspective. The team encompasses considerable expertise, international experience, and a deep understanding of the industry, offering practical, tailored solutions and academic insights.
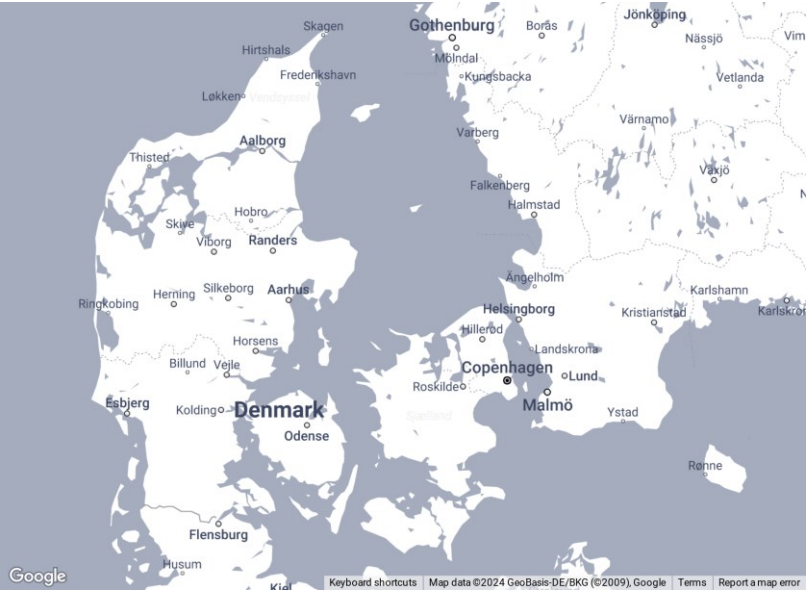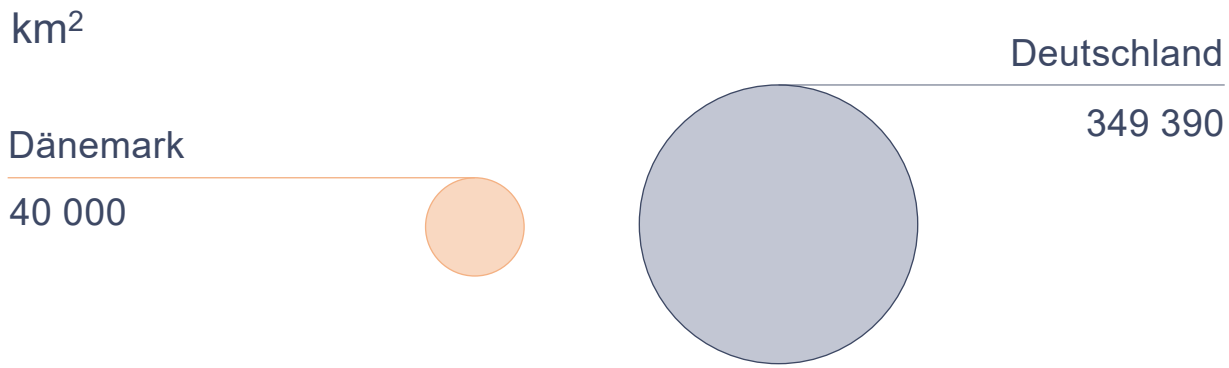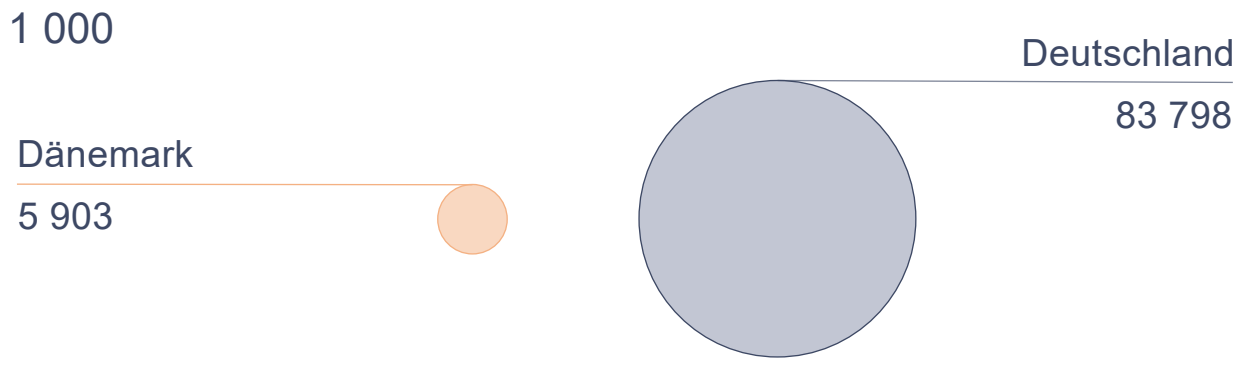
Speaker

Thomas WIMMER, M.Sc.
Senior Consultant and Project Management

Area of Denmark compared to Germany

km^2

Deutschland

349 390

Dänemark

40 000

Population of Denmark compared to Germany 2022

1 000

Deutschland

83 798

Dänemark

5 903

Employees and gross value added by sector 2021 in Denmark

%

Employed

2,0	19,4	78,6

Gross value added

1,0	22,2	76,8

■ Agriculture and forestry, fishing   ■ Manufacturing industries   ■ Service industries
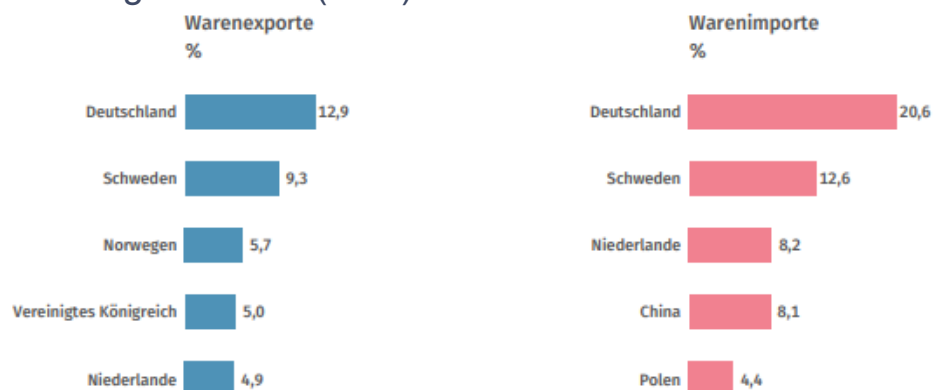
Source: Statistisches Länderprofil Dänemark, Statistisches Bundesamt (Destatis), 2024
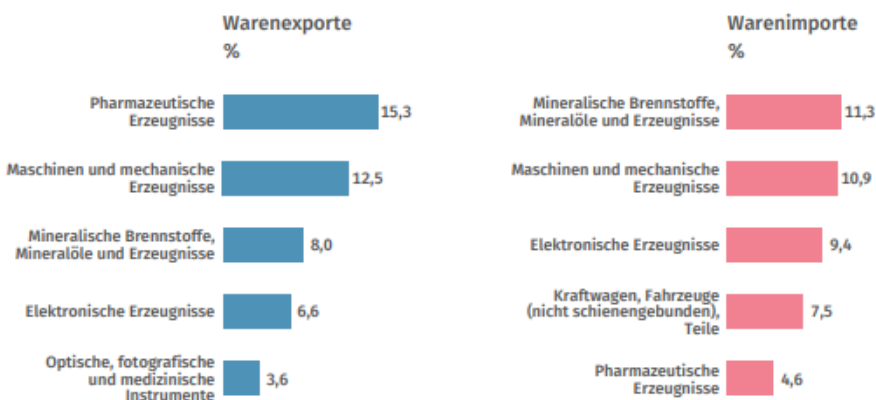
Market development and technology penetration in Denmark 2022

Main trading partners 2022

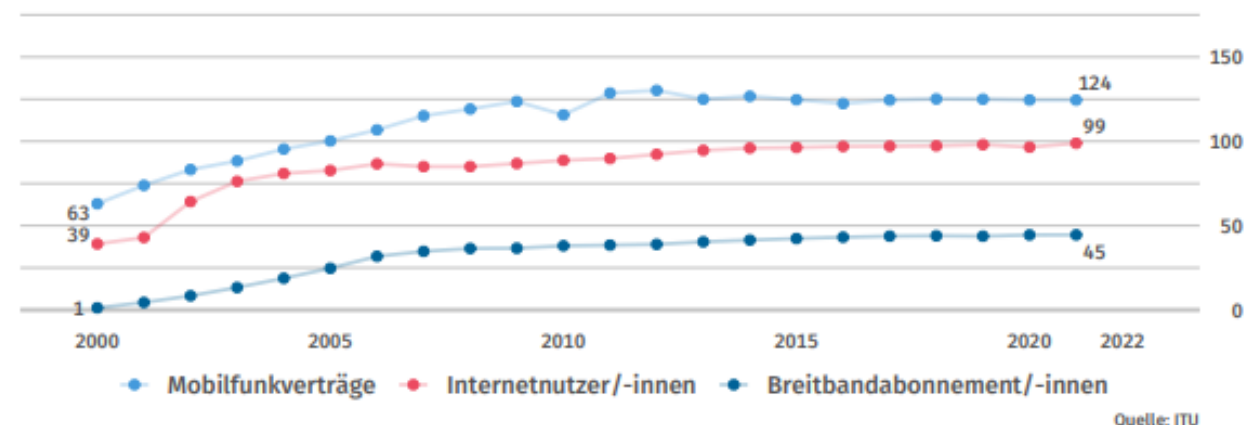Classification of product groups: Harmonised System for the Description and Coding of Goods (HS2).

Warenexporte %

Deutschland	12,9
Schweden	9,3
Norwegen	5,7
Vereinigtes Königreich	5,0
Niederlande	4,9

Warenimporte %

Deutschland	20,6
Schweden	12,6
Niederlande	8,2
China	8,1
Polen	4,4

Main product groups 2022

Warenexporte %

Pharmazeutische Erzeugnisse	15,3
Maschinen und mechanische Erzeugnisse	12,5
Mineralische Brennstoffe, Mineralöle und Erzeugnisse	8,0
Elektronische Erzeugnisse	6,6
Optische, fotografische und medizinische Instrumente	3,6

Warenimporte %

Mineralische Brennstoffe, Mineralöle und Erzeugnisse	11,3
Maschinen und mechanische Erzeugnisse	10,9
Elektronische Erzeugnisse	9,4
Kraftwagen, Fahrzeuge (nicht schienengebunden), Teile	7,5
Pharmazeutische Erzeugnisse	4,6

Source: UN Comtrade

Spread of modern communication technology:

per 100 inhabitants

Legend: Mobilfunkverträge · Internetnutzer/-innen · Breitbandabonnement/-innen

Quelle: ITU

The high penetration of modern communication technologies among the population is illustrated, indicating a well-developed digital infrastructure.

Source: Statistisches Länderprofil Dänemark, Statistisches Bundesamt (Destatis), 2024

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European Commission data (DESI 2023)

At least 100 Mbps fixed broadband take-up, all households
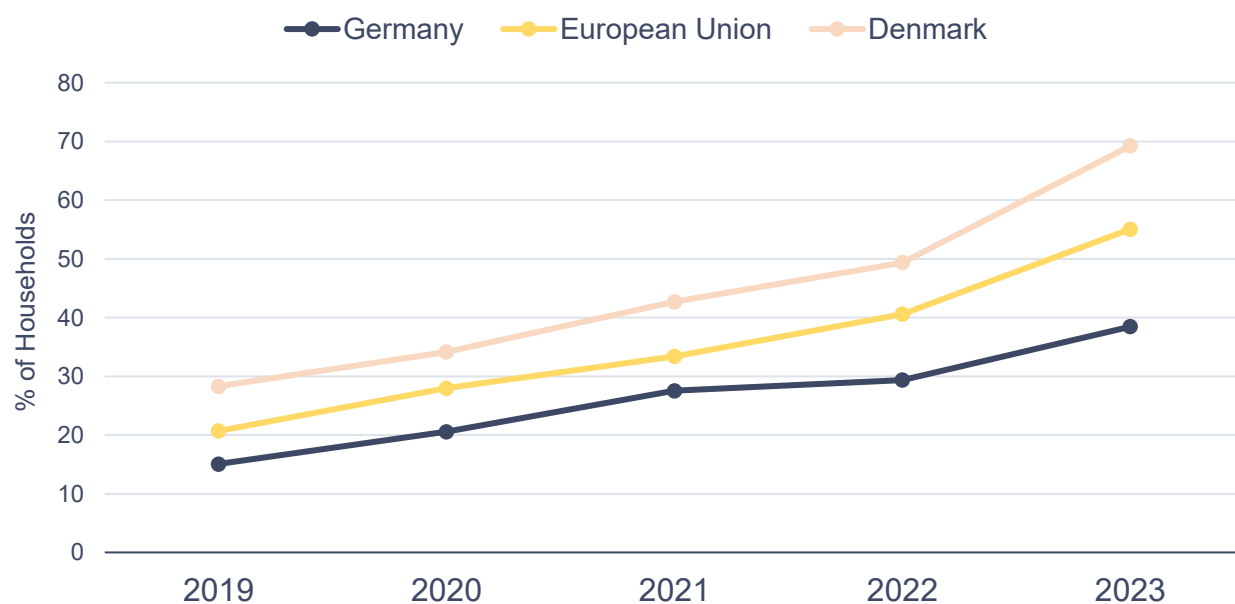
Denmark shows a rapid increase, significantly outpacing the European Union average and Germany. By 2023, Denmark leads with the highest take-up rate.

At least 1 Gbps broadband take-up, all households
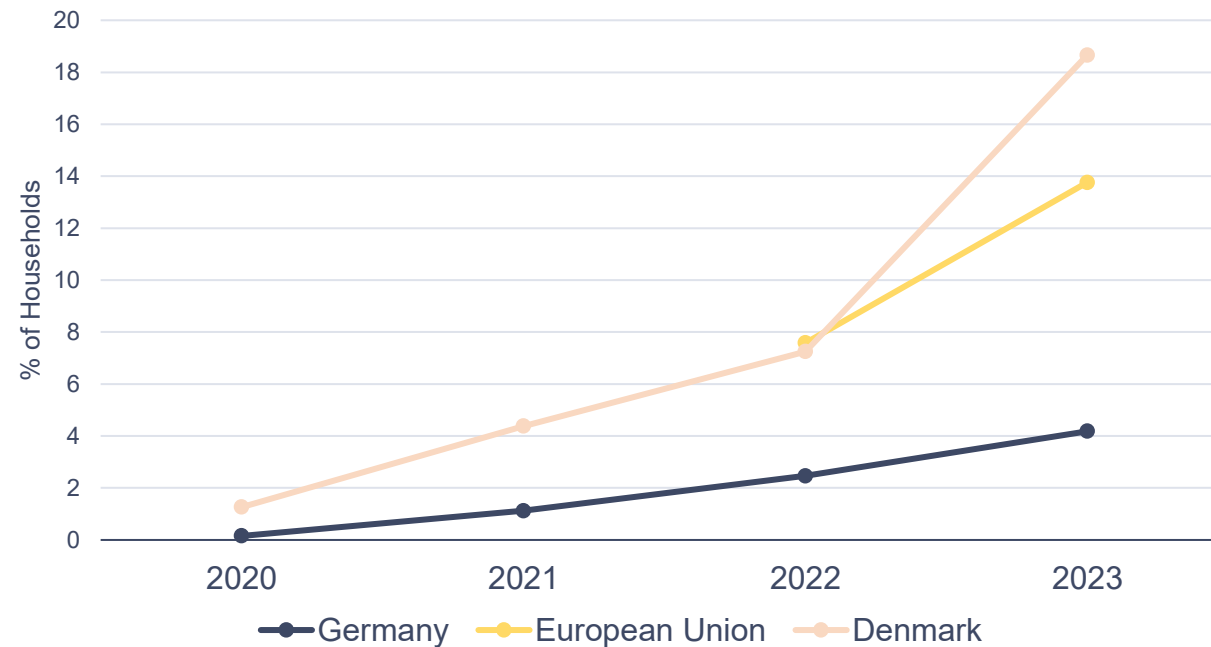
This chart presents the percentage of households with at least 1 Gbps broadband. Denmark again shows a sharp rise, far surpassing the EU's average and Germany, indicating a strong adoption of high-speed broadband in Denmark.

Source: European Commission

European Commission data (DESI 2023)

VHCN (Very High Capacity Network) coverage, total
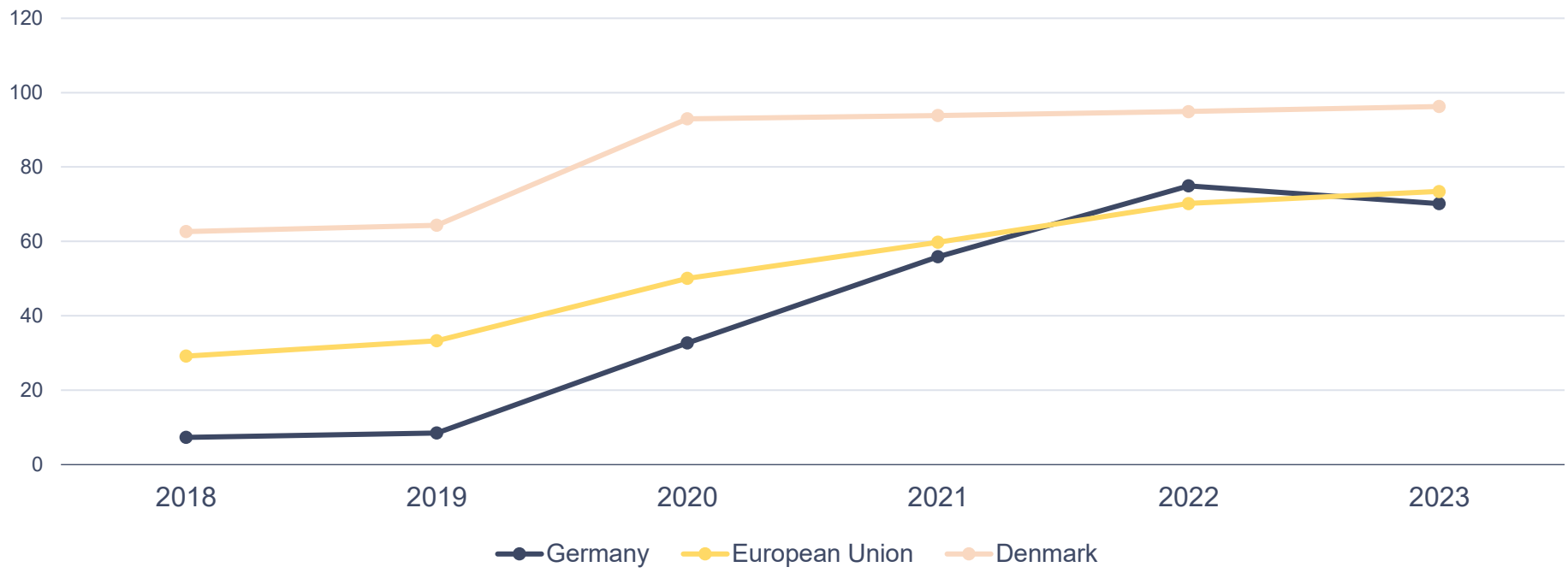
All graphs collectively highlight Denmark's commitment to highspeed internet accessibility.

Source: European Commission

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FTTH Council data

The chart presents data from the FTTH Council regarding the Fiber to the Home/Building (FTTH/B) coverage and penetration rates in Denmark and Germany.

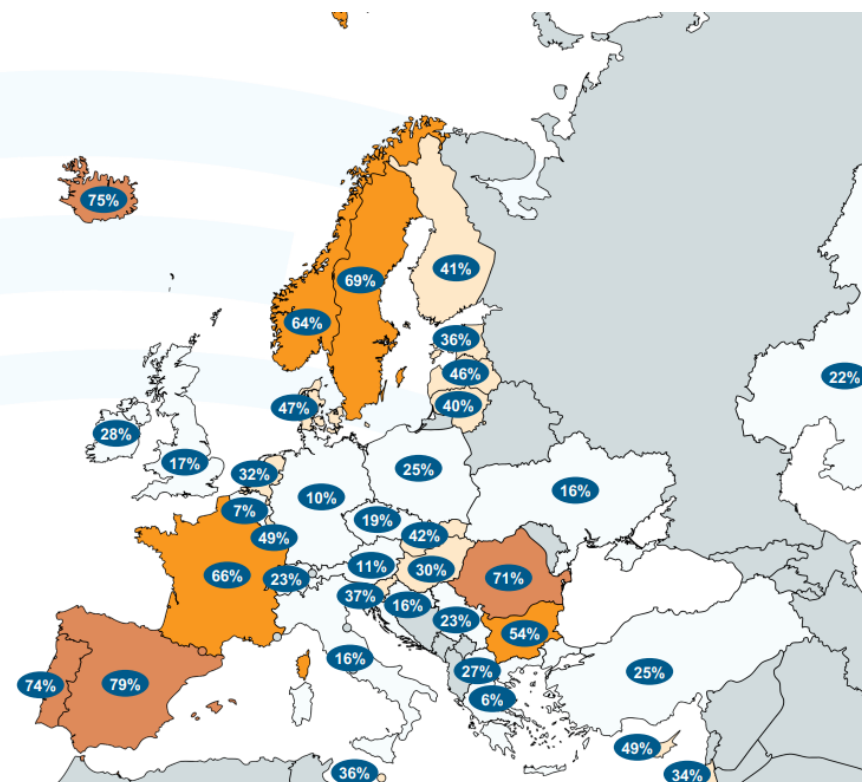|	DK	DE
FTTH/B coverage rate (HP / H)	84%	40%
FTTH/B take-up rate (HA / HP)	56%	25%
FTTH/B penetration rate (HA / H)	**47%**	**10%**

FTTH/B Penetration Rate
Summary map

FTTH/B penetration rate map (subscribers / households) - September 2023

Penetration rate
EU27+UK: **34% (+ 5 p.p yoy)**
EU39 : **34.7% (+ 5 p.p yoy)**

- ☐ FTTH/B Penetration < 30%
- ☐ FTTH/B Penetration 30% > 50%
- ☐ FTTH/B Penetration 50% > 70%
- ☐ FTTH/B Penetration > 70%

FTTH COUNCIL EUROPE — With thanks to IDATE

Source: IDATE for FTTH Council EUROPE

Full fibre for a digital and sustainable Europe

Source: FTTH Council

Median fixed broadband download speed

Snapshot over FTTH, DOCSIS, DSL

Denmark with median values around twice as high as Germany

Denmark's broadband strategy (2021)

– covers all households and businesses by 100/30 Mbps

  connection

  by 2025

– covers 98% of households and businesses by 1 Gbps

  download speeds by 2025

– identifies the needs and demand for gigabit speeds by 2030.
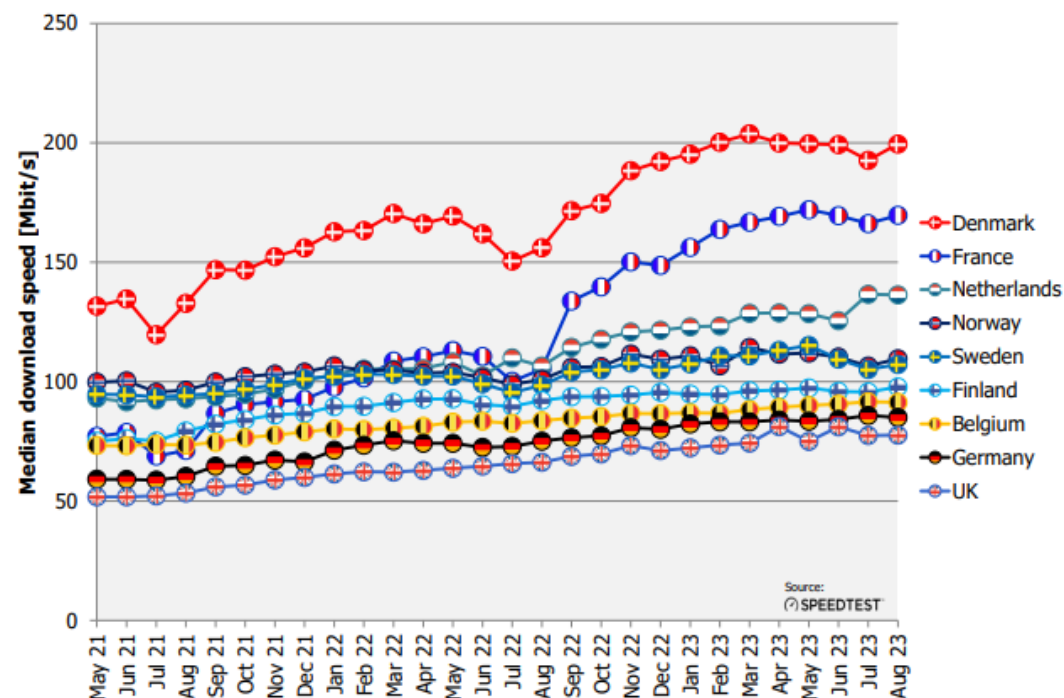
Median fixed broadband download speed per month May 2021
– Aug 23 per country [Data: Ookla Speedtest]

Source: Tefficient AB, for Fiberalliancen

Gbit/s Fiber Coverage in Denmark
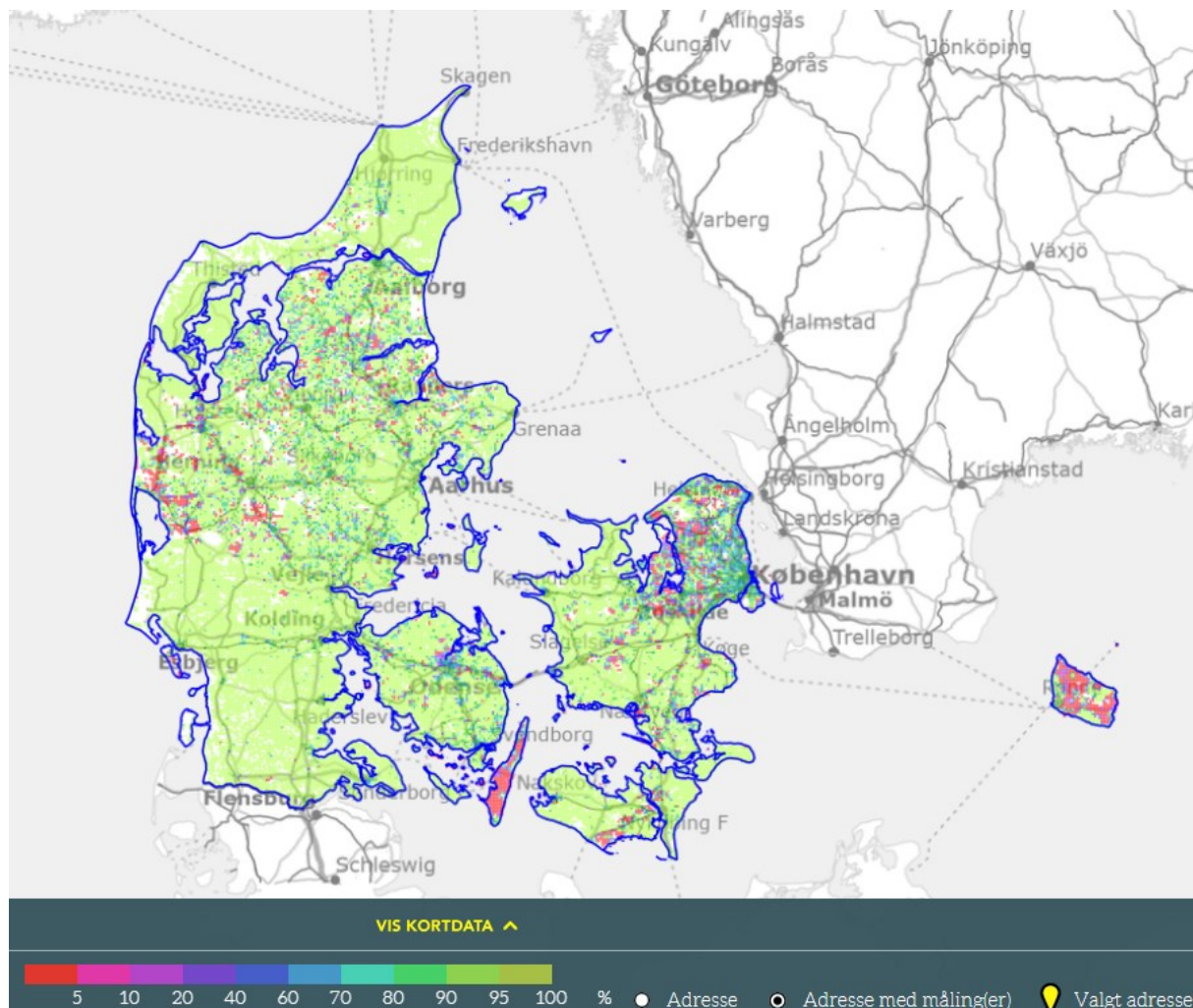
– Data provided by network owners directly

– Capital area: special situation
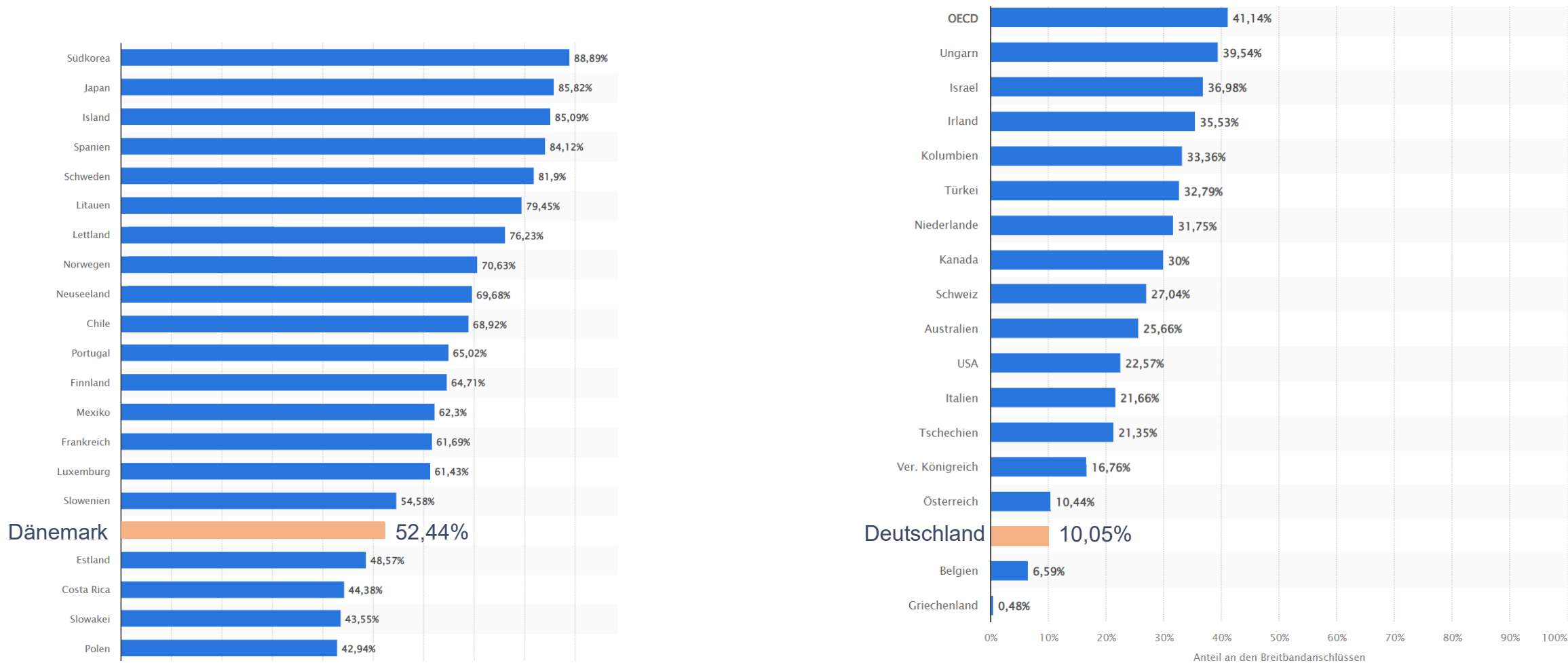
- Selection shows fiber broadband coverage
- Minimum of 1 / 1 Gbit/s

- Notes: „red islands" very low populated
- Capital area, special situation

Source: Kort | tjekditnet.dk

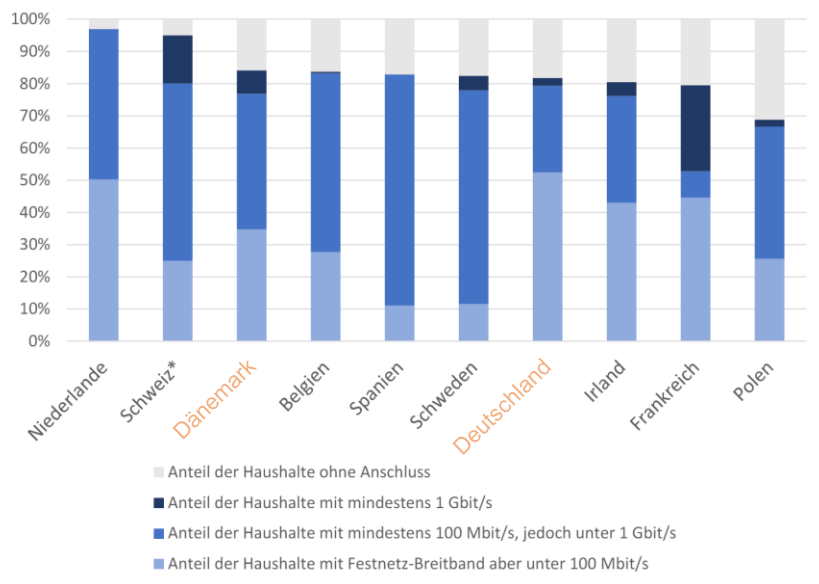# Share of fiber in fixed broadband connections in OECD in June 2023

Land	Anteil
Südkorea	88,89%
Japan	85,82%
Island	85,09%
Spanien	84,12%
Schweden	81,9%
Litauen	79,45%
Lettland	76,23%
Norwegen	70,63%
Neuseeland	69,68%
Chile	68,92%
Portugal	65,02%
Finnland	64,71%
Mexiko	62,3%
Frankreich	61,69%
Luxemburg	61,43%
Slowenien	54,58%
Dänemark	**52,44%**
Estland	48,57%
Costa Rica	44,38%
Slowakei	43,55%
Polen	42,94%

Land	Anteil
OECD	41,14%
Ungarn	39,54%
Israel	36,98%
Irland	35,53%
Kolumbien	33,36%
Türkei	32,79%
Niederlande	31,75%
Kanada	30%
Schweiz	27,04%
Australien	25,66%
USA	22,57%
Italien	21,66%
Tschechien	21,35%
Ver. Königreich	16,76%
Österreich	10,44%
Deutschland	**10,05%**
Belgien	6,59%
Griechenland	0,48%

Anteil an den Breitbandanschlüssen

Source: de.statista.com
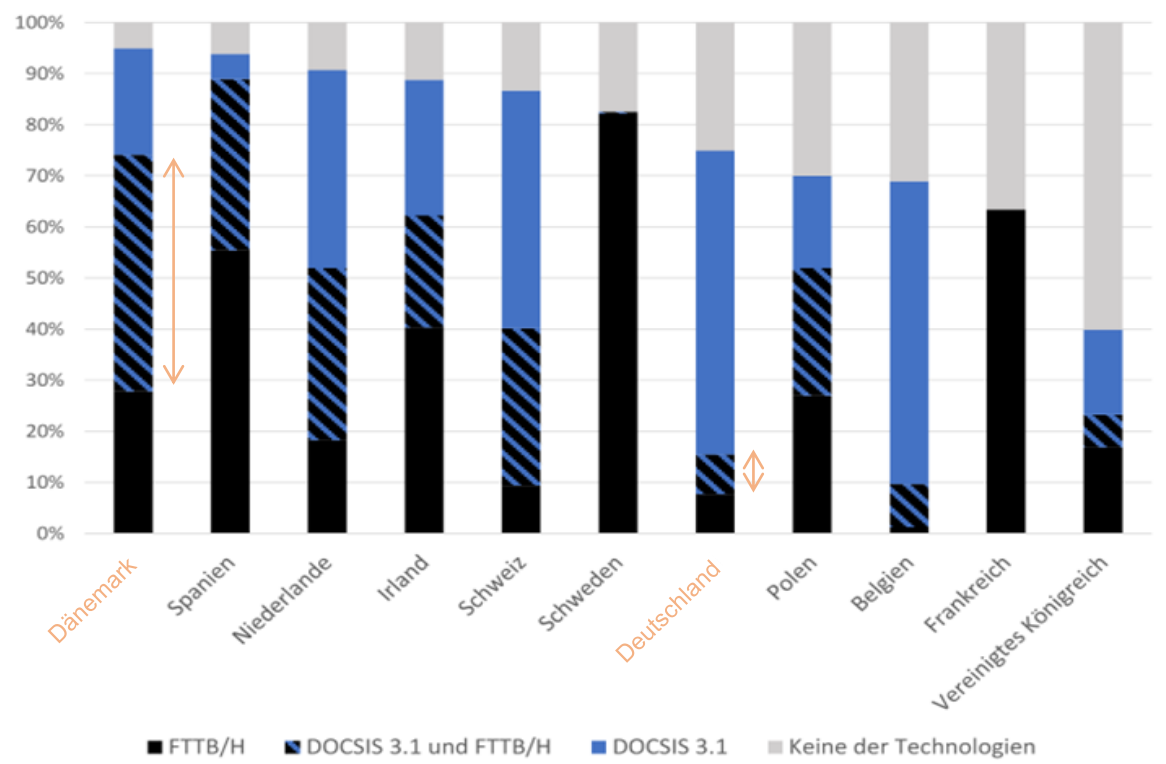
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FTTH/B in % homes

- – Denmark is a more mature fiber market

- – Denmark has more overlap in DOCSIS and fiber, as fiber rollout started earlier than in Germany, driven by regional utilities

Broadband request for fixed lines
(by download speed)

Anteil der Haushalte ohne Anschluss
Anteil der Haushalte mit mindestens 1 Gbit/s
Anteil der Haushalte mit mindestens 100 Mbit/s, jedoch unter 1 Gbit/s
Anteil der Haushalte mit Festnetz-Breitband aber unter 100 Mbit/s

FTTH/B and DOCSIS 3.1 coverage
(based on number of households)

FTTB/H   DOCSIS 3.1 und FTTB/H   DOCSIS 3.1   Keine der Technologien

Source: DESI 2022, WIK 2022

Key drivers in Denmark

Cable Fiber evolution, beginning in 2000's

Structural separation of incumbent (regulated for 20 yrs by NRA)
TDC legal split up in 2019 to TDC NET (mobile & broadband) and Nuuday
(services, multi-brands)

Fiber rollout driven by different network owners, mostly regional utilities

Wholesale and retail turnovers from equal importance for utility network owners

Layer-2 wholesale standard

Market Cooperation and Open-Access Platforms

ISP's present at Platforms for full market coverage

Regulation: two wholesale markets, for high capacities (FTTH / DOCSIS) and lower bandwidth (x-DSL / copper / FWA)

Regional / local markets

Binding commitments for open access provided by regional SMP operators in high capacities market

Examples for regional fibre footprints (Utilities) in 2022

Source: Fiber Alliance

Smart City Index 2024

City	Smart City Rank 2024	Smart City Rating 2024	Structure 2024	Technology 2024	Smart City Rank 2023	Change
Zurich	1	AAA	AAA	AA	1	—
Oslo	2	AA	AA	A	2	—
Canberra	3	AA	AAA	A	3	—
Geneva	4	AAA	AAA	AA	9	+5▲
Singapore	5	A	A	A	7	+2▲
Copenhagen	6	AA	AA	A	4	-2▼
Lausanne	7	AA	AA	A	5	-2▼
London	8	A	BBB	AA	6	-2▼
Helsinki	9	AA	AA	A	8	-1▼
Abu Dhabi	10	BB	BB	BB	13	+3▲
Stockholm	11	A	A	A	10	-1▼
Dubai	12	BB	BB	BB	17	+5▲
Beijing	13	BB	BB	BB	12	-1▼
Hamburg	14	BBB	BBB	BBB	11	-3▼
Prague	15	A	A	A	14	-1▼
Taipei City	16	A	BBB	A	29	+13▲
Seoul	17	AA	BBB	AAA	16	-1▼
Amsterdam	18	A	BBB	A	15	-3▼
Shanghai	19	BB	BB	BB	25	+6▲
Hong Kong	20	A	BBB	AAA	19	-1▼
Munich	21	A	A	A	20	-1▼
Sydney	22	A	BBB	A	18	-4▼

City	Smart City Rank 2024	Smart City Rating 2024	Structure 2024	Technology 2024	Smart City Rank 2023	Change
Vienna	23	AA	AA	A	28	+5▲
Tallinn	24	BBB	BBB	BBB	32	+8▲
Riyadh	25	B	B	B	30	+5▲
Reykjavik	26	BBB	A	BBB	26	—
Luxembourg	27	BBB	A	BB	45	+18▲
Wellington	28	BBB	A	BBB	23	-5▼
Bilbao	29	BBB	BBB	BB	27	-2▼
Brisbane	30	A	A	A	24	-6▼
Auckland	31	BBB	BBB	A	22	-9▼
Ljubljana	32	BBB	BBB	A	47	+15▲
Melbourne	33	A	BBB	A	31	-2▼
New York	34	BB	BB	BB	21	-13▼
Madrid	35	BB	BB	BBB	37	+2▲
Boston	36	BBB	BBB	A	34	-2▼
Berlin	37	BBB	BBB	BBB	33	-4▼
Warsaw	38	BBB	BBB	BBB	44	+6▲
Gothenburg	39	A	BBB	A	36	-3▼
Brussels	40	BBB	BB	A	35	-5▼
Rotterdam	41	A	BBB	A	41	—
The Hague	42	A	BBB	A	43	+1▲
Vancouver	43	BBB	BBB	BBB	42	-1▼
Dusseldorf	44	BB	BBB	B	38	-6▼

Quelle: imd.org

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Worl Digital Competitiveness Ranking

Denmark

OVERALL & FACTORS - 5 years	2019	2020	2021	2022	2023
OVERALL	04	03	04	01	04
Knowledge	06	06	08	06	09
Technology	11	09	09	07	07
Future readiness	02	01	02	01	03

Germany

OVERALL & FACTORS - 5 years	2019	2020	2021	2022	2023
OVERALL	17	18	18	19	23
Knowledge	12	12	14	11	14
Technology	31	31	31	27	34
Future readiness	16	19	18	19	24

2023 COMPETITIVENESS RANKING

		Score	
01	USA	100.00 ↗	1
02	Netherlands	98.10 ↗	4
03	Singapore	97.40 ↗	1
04	Denmark	96.93 ↙	3
05	Switzerland	96.24	-
06	Korea Rep.	94.80 ↗	2
07	Sweden	94.12 ↙	4
08	Finland	94.05 ↗	1
09	Taiwan, China	93.73 ↗	2
10	Hong Kong SAR	93.64 ↙	1
11	Canada	91.98 ↙	1
12	UAE	88.86 ↗	1
13	Israel	87.70 ↗	2
14	Norway	85.96 ↗	2
15	Belgium	85.95 ↗	8
16	Australia	85.28 ↙	2
17	Iceland	84.94 ↗	4
18	Estonia	84.77 ↗	2
19	China	84.41 ↙	2
20	United Kingdom	83.12 ↗	4
21	Ireland	81.48 ↗	3
22	Austria	81.10 ↙	4
23	Germany	80.86 ↙	4
24	Czech Republic	79.42 ↗	9
25	New Zealand	79.08 ↗	2
26	Luxembourg	78.73 ↗	4
27	France	78.65 ↗	5
28	Lithuania	77.23 ↗	3
29	Qatar	77.01 ↙	3
30	Saudi Arabia	76.99 ↗	5

Quelle: imd.org

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SBR
SBR-net Consulting AG

Objectives

#1: Digitization is a means, not a goal in itself

Data and new technology should be used actively in solving society's great challenges, by e.g. remedying worker shortage, supporting climate change mitigation, improving the service in the public sector and making room for innovation.

2: Everyone is included

Everyone must be able to take part in the digital society, and there has to be help and alternatives for the citizens, who are not able to use digital solutions.

3: Focus on coherence, transparency and trust

Citizens and businesses should experience a coherent and trustworthy public sector, where one has access to all one's data.

4: A responsible digital development

Responsible use of data and new technology happens within the scope of law and ethics. By doing so, the development of digital solutions can stay innovative as well as uphold citizens' trust and legal rights.

5: Shared digital foundations

The development of future digital solutions focus on reuse of data, shared architecture and standards, that enable integration across digital solutions.

Agency for Digital Government

Source: New Joint Government Digital Strategy aims to overcome societal challenges (digst.dk)

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Objectives

\# major investments in digitalisation across the public and private sectors, 25 initiatives to be implemented in the relevant period

\# invest: DKK 800 mil. (~ EUR 110 mil.) in the development of a better digital future

\# artificial intelligence, including an AI strategy published in 2024

\# green transition

\# digital education among children and young people

\# the strategy will help increase growth, strengthen the digital transformation in the business community and support the arrival of more IT specialists
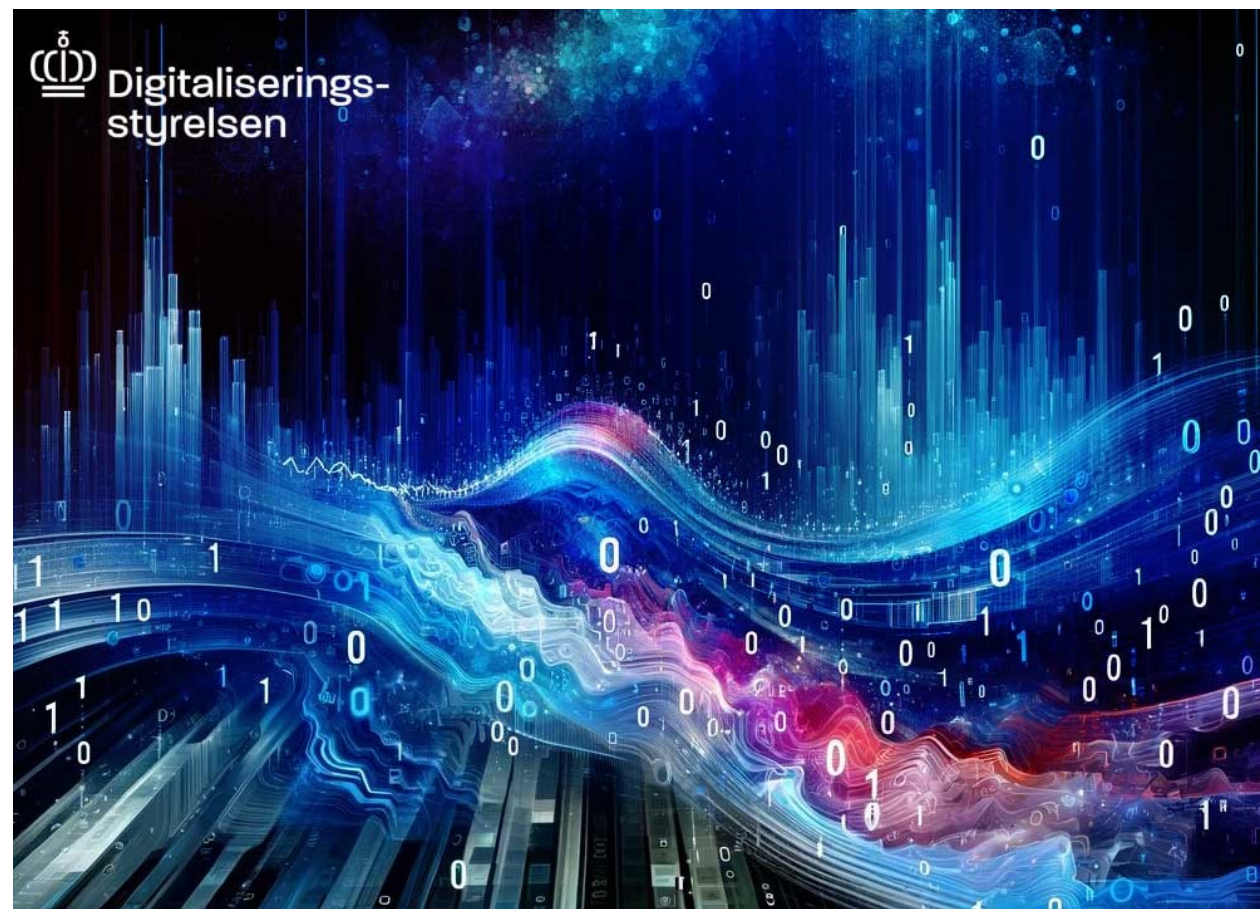
Source: New digitalisation strategy sets the direction for the digital development of Denmark | Ministry of Digitalisation and Gender Equality (digmin.dk)

− Report 2023 covers more than 160 UN Member States

− Nordic countries in the lead, followed by Germany and Austria with minor differentiation

− Sustainable development and sustainability in general gain importance in Telco Sector as well

Rank	Country	Score	Performance by SDG
1	Finland	86.76	
2	Sweden	85.98	
3	Denmark	85.68	
4	Germany	83.36	
5	Austria	82.28	

	DK	DE
SDG1: No poverty		
SDG2: Zero hunger		
SDG3: Good health and well-being		
SDG4: Quality education		
SDG5: Gender equality		
SDG6: Clean water and sanitation		
SDG7: Affordable and clean energy		
SDG8: Decent work and economic growth		
SDG9: Industry, innovation and infrastructure		
SDG10: Reduced inequalities		
SDG11: Sustainable cities and communities		
SDG12: Responsible consumption and production		
SDG13: Climate action		
SDG14: Life below water		
SDG15: Life on land		
SDG16: Peace, justice and strong institutions		
SDG17: Partnerships for the goals		

Source: Sustainable Development Report 2023 (sdgindex.org)

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Future Outlook – VATM in Denmark

Factors Influencing the Danish Market

- Understanding of how market evolved in DK

- Role of regulation

- Role of utilities / energy sector in fibre rollout

- Open access models / solutions

- Digitalisation as key driver for innovation

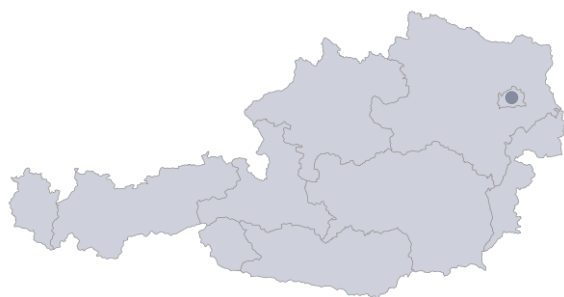- Sustainability in materials

- and a lot more

Source: unsplash.com

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