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European FTTH Panorama

Place of Sweden

FTTH: Where will be the growth Worldwide ?



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Agenda

0. FTTH worldwide picture
1. European study background
2. General overview and main trends
3. Leading countries and place of Sweden
4. FTTH in rural areas and place of Sweden
5. Key conclusions
6. FTTH: Where's the growth worldwide ?

FTTH worldwide picture

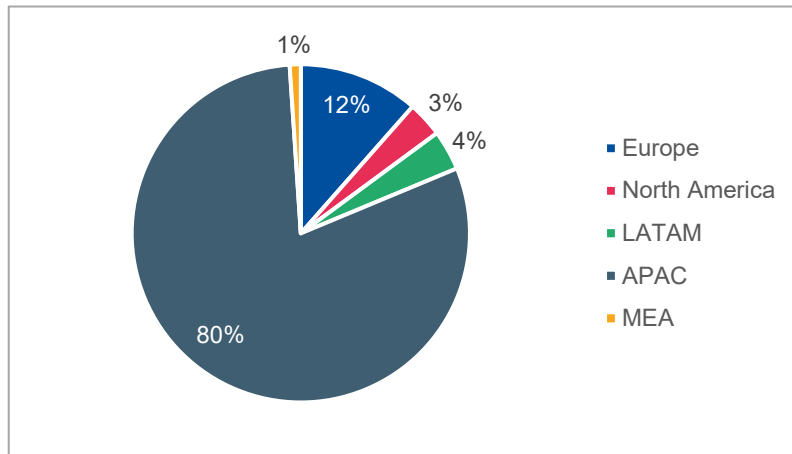
Regions tend to differ in terms of technology adoption. It is confirmed that there is no single path to implementing superfast broadband technologies

- **FTTH/B networks** have been widely deployed and adopted in the **Asia-Pacific** region. In Europe, FTTH/B is making real strides, but still having to compete with copper-based architectures from many incumbents, that are planning to move towards fibre in the coming years. In North America, strategies are concentrated **around legacy copper network switchoffs** and migrating to FTTH in the coming months and years. In Latin America, major FTTH/B deployments have been observed mainly in **Brazil, Mexico and Argentina**.
- **VDSL networks:** Many incumbents have switched to FTTx and new generation copper based solutions (Vectoring or G.fast) as a way to use the legacy copper infrastructure. Many of these players are, however, **planning now a full fibre migration** for the coming years.
- **DOCSIS 3.x networks:** Have been mainly deployed in the USA, although some European countries are home to widely deployed cable networks. Many of these networks are being upgraded to **DOCSIS 3.1** in order to provide Gigabit speeds. Some cable companies are also deploying new FTTH solutions as a way to have a more scalable infrastructure over time. Although DOCSIS 4.0 was released in 2020, enabling speeds of 10 Gbps, major players are not planning to upgrade to 4.0 anytime soon.

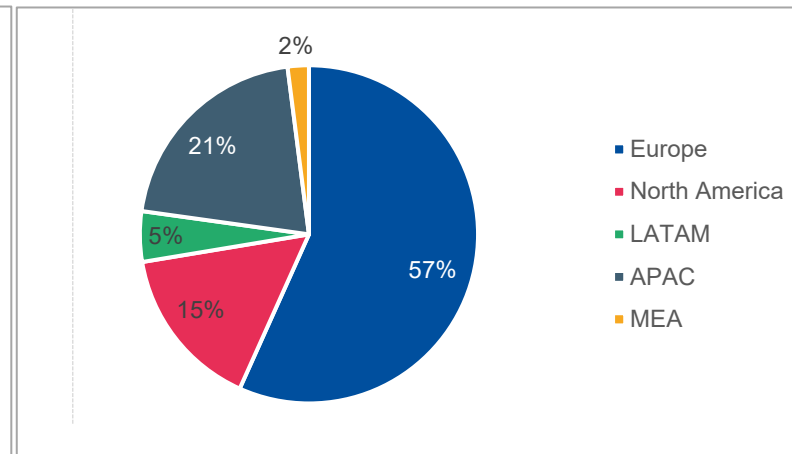
874 million FTTx subscribers worldwide by June 2020

Geographical breakdown of the three main superfast broadband architectures, June 2020

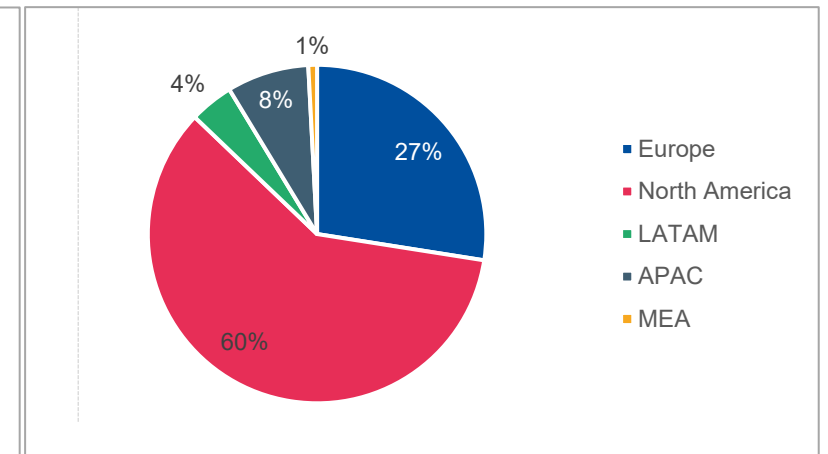
FTTH/B: 663 million subscribers



VDSL: 89 million subscribers



DOCSIS 3.x: 122 million subscribers



Source: IDATE DigiWorld, *World FTTx markets*, November 2020

01 | Study Background

Methodology

- Mission on behalf of the **FTTH Council Europe**
- Provide a complete summary of the status of FTTH/B in Europe

ACTIONS

Scope



- Analysis of 39 countries
- Data per player for FTTH/B and other fibre-based architectures
- Key parameters study: technical, financial, business model, figures

Bottom-up methodology



- Desk research
- Direct contacts with leading players and IDATE partners within countries
- Information exchange with FTTH Council Europe members

Results



- Both quantitative and qualitative data
- Market status in the country
- Strategic approach of involved players

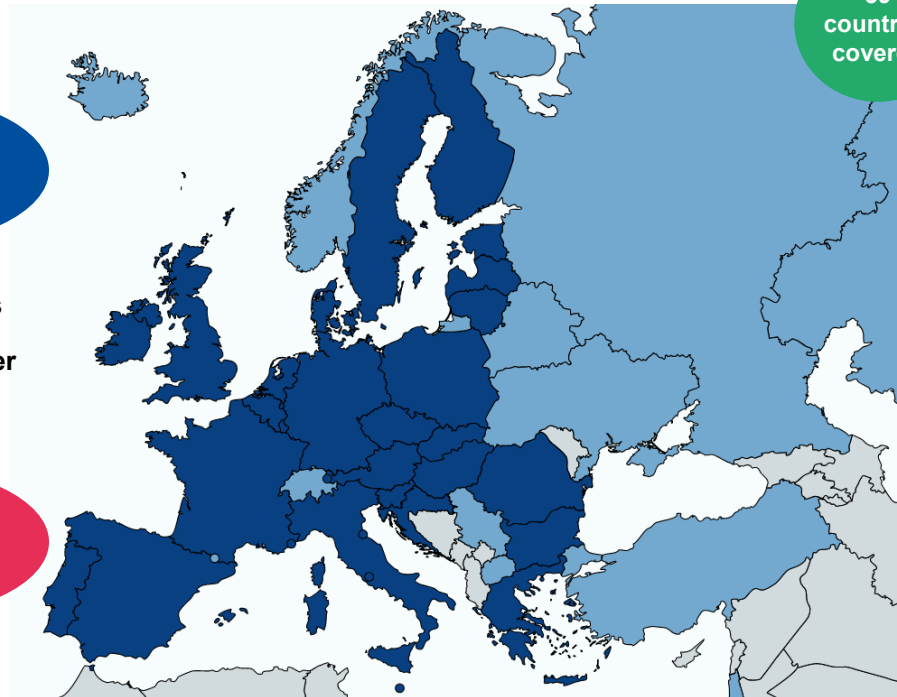
02 | General overview and main trends

FTTH/B figures as at September 2019

As at September 2019 in EU39*:

- **70.4 million FTTH/B subscribers**
- **Almost 172 million FTTH/B Homes Passed**

FTTH Council Europe scope at September 2019



Take-up rate

EU28 : 43.3%
EU39 : 40.9%

■ EU28 countries

■ Countries under study

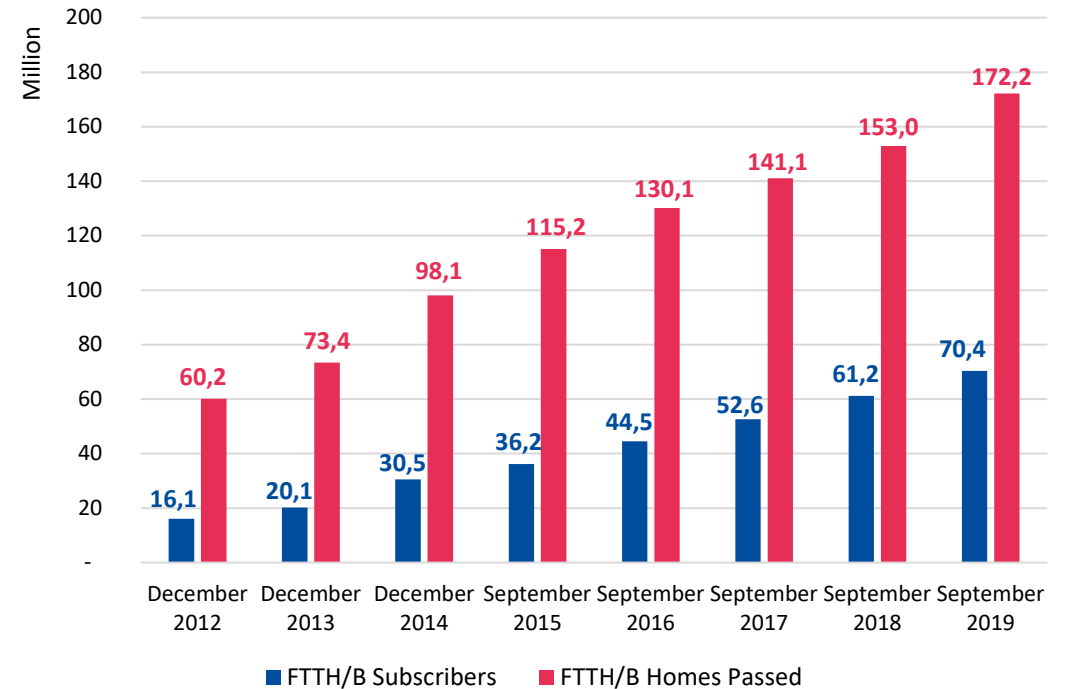
Coverage rate

EU28 : 39.4%
EU39 : 49.9%

- (1) EU39 = EU28 (excl. Cyprus) + 4 CIS countries + Andorra, Iceland, Israel, North Macedonia, Norway, Serbia, Switzerland, Turkey
- (2) Cyprus was replaced by North Macedonia at end-2012 because the FTTH/B market is much more developed in this country.

FTTH/B European market evolution (EU39)

In terms of Homes Passed and Subscribers (2012-2019)



Source: IDATE for FTTH Council EUROPE

Trends from 2012 to 2019

FTTH/B Subscribers

× 4.4

Homes Passed evolution

× 2.9

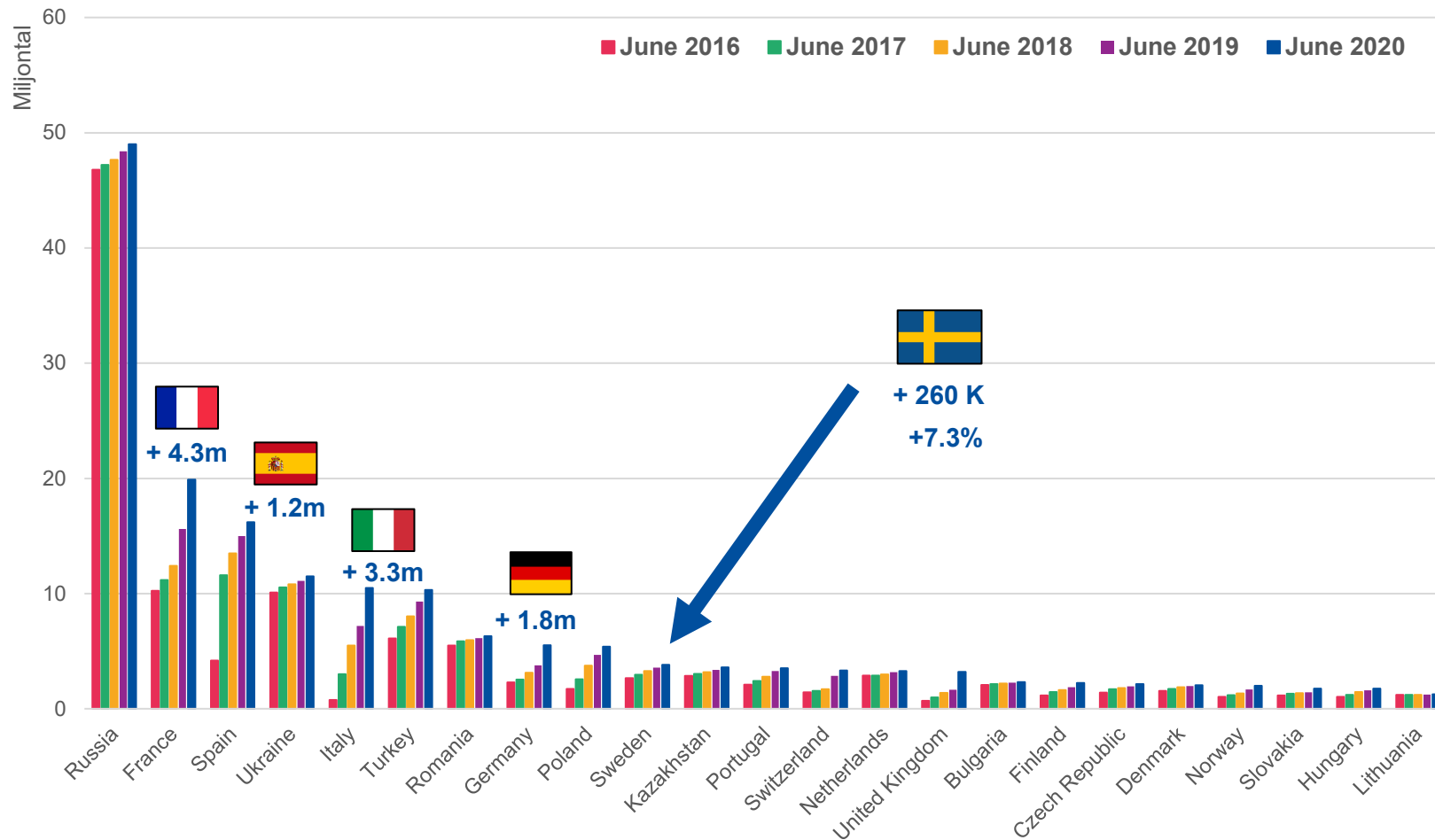
03 | Leading countries

Update at June 2020

General Ranking: FTTH/B Homes passed*

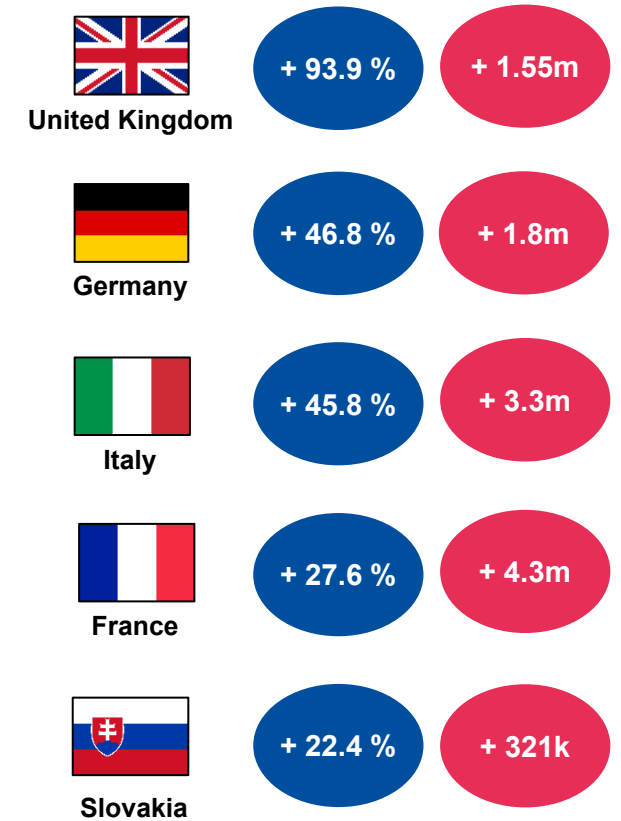
European ranking in terms of FTTH/B Homes passed over time (in million homes)

Data comparison between June 2016 and June 2020



5 fastest growing markets in Europe

Data from June 2019 to June 2020 (in terms of FTTH/B Homes Passed)

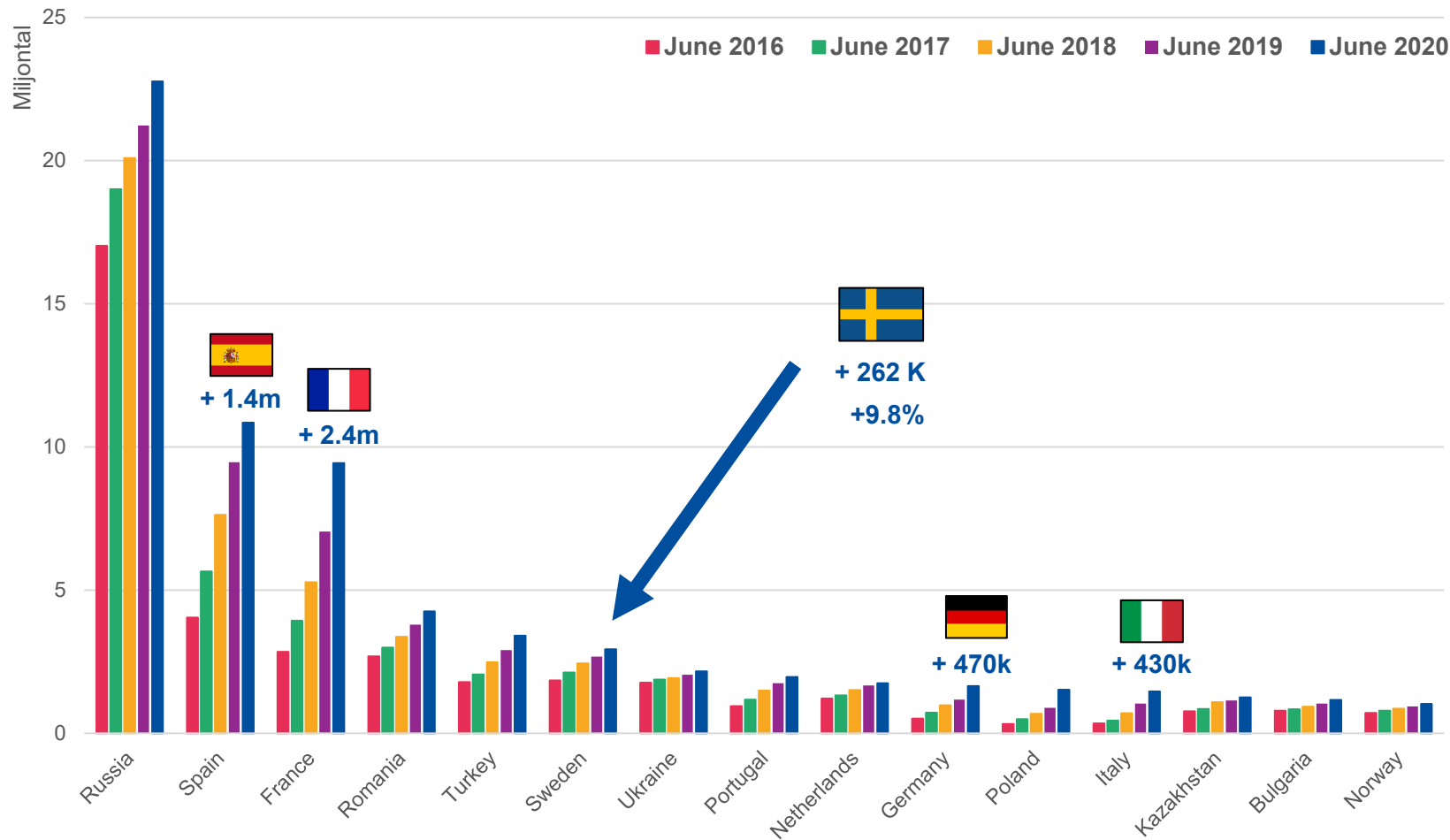


* Graph only includes countries with over 1 million FTTH/B Homes Passed

General Ranking: FTTH/B Subscribers*

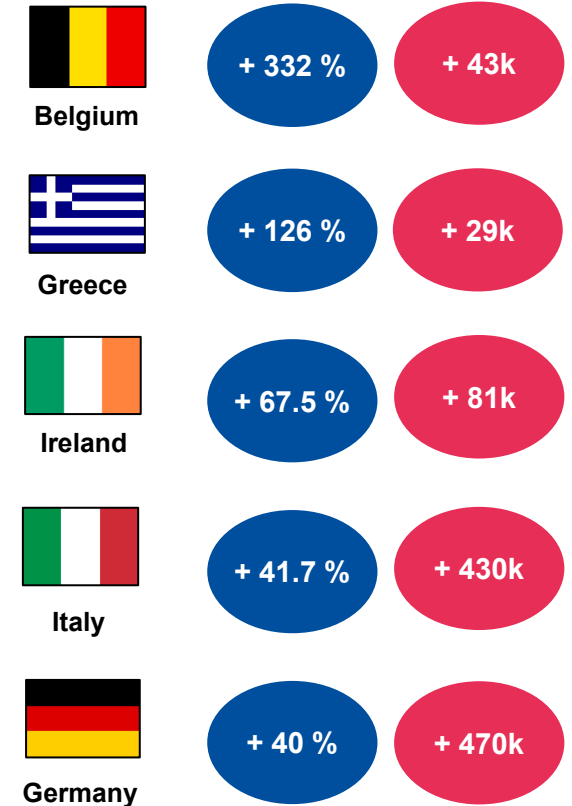
European ranking in terms of FTTH/B Subscribers over time (in million homes)

Data comparison between June 2016 and June 2020



5 fastest growing markets in Europe

Data from June 2019 to June 2020 (in terms of FTTH/B Subscribers)



* Graph only includes countries with over 1 million FTTH/B Subscribers

General Ranking: FTTH/B Coverage

FTTH/B coverage* as at June 2020

(* Homes passed / Households)

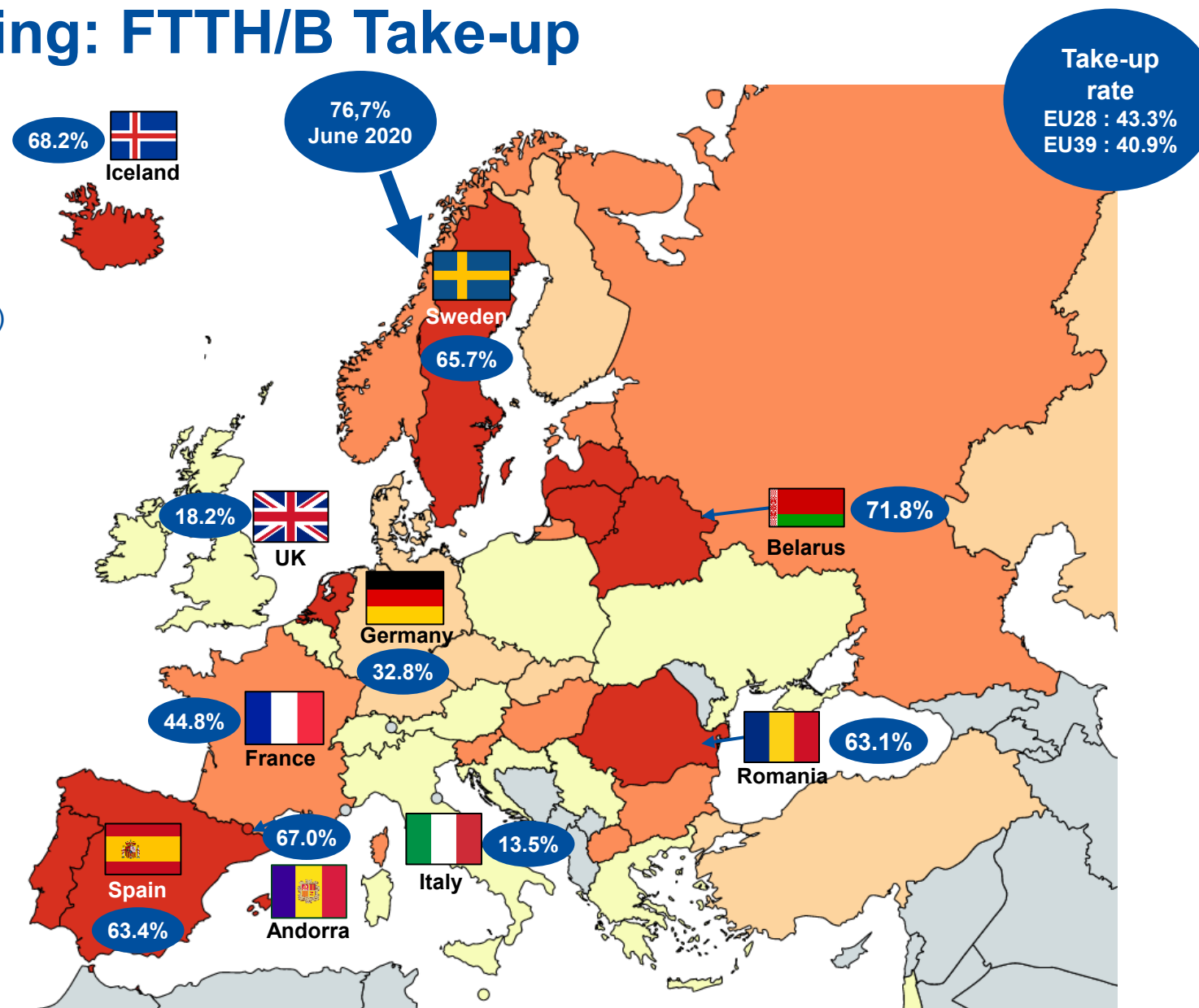
- FTTH/B coverage > 90%
- FTTH/B coverage 70 – 90 %
- FTTH/B coverage 50 – 70 %
- FTTH/B coverage < 50 %



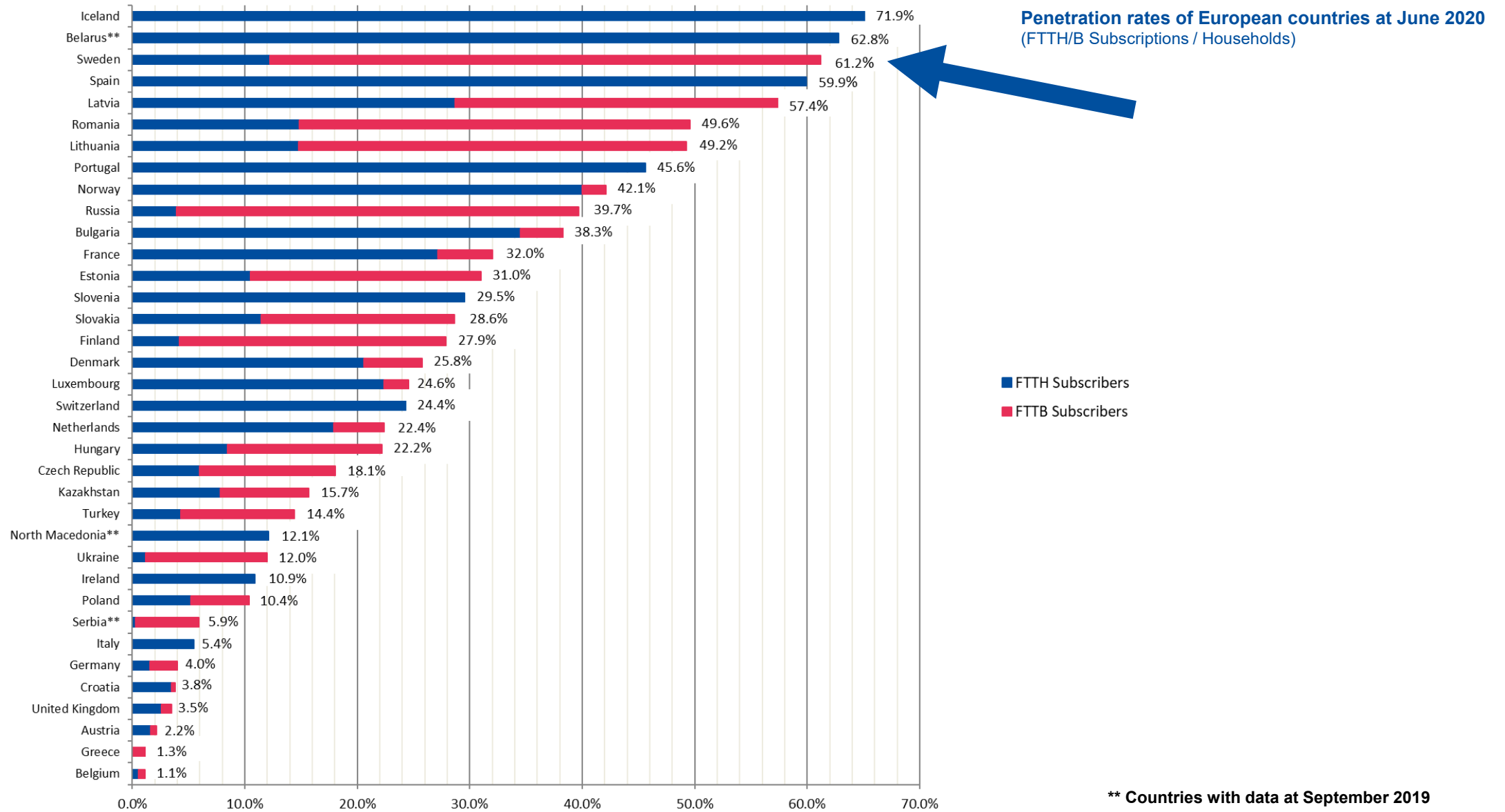
General Ranking: FTTH/B Take-up

FTTH/B take-up* as at September 2019
(*Subscriptions / Homes Passed)

- FTTH/B take-up > 50%
- FTTH/B take-up 40 – 50 %
- FTTH/B take-up 30 – 40 %
- FTTH/B take-up < 30 %



European Ranking at June 2020



04 | FTTH in Rural Areas

Europe is committed to reach non dense areas with high speed networks

Huge discrepancies between countries



Digital Agenda for Europe (DAE)

Gigabit Society: DAE seeks to achieve the best possible Internet connection for all EU citizens by 2025 (1 Gbps)

Goals for 2020:

- Provide an Internet connection of at least 30 Mbps to all Europeans
- Guarantee 5G connectivity in at least one major city in each Member State by 2020

Goals for 2025:

- Provide a 1 Gbps connection to all socio-economic institutions
- Provide an Internet connection of at least 100 Mbps to all European households
- Guarantee uninterrupted 5G coverage in all urban areas and on the main terrestrial transport corridors

Rural areas are part of these goals and stakeholders should be committed to deploy these networks, where full fibre is one the main options.



Strategies and technological approaches in each country under study

• 3 approaches to reach DAE targets:

Technology-neutral



Intermediate approach



FTTH only



Rural FTTH in Europe

- This study is based on data and information collected by the European Commission (through DESI studies) and information gathered from local regulators in each country (if available).

Definition of Rural and Urban households are the same of the European Commission in order to be aligned with their definition. The goal is to provide a general overview of the evolution of rural FTTH deployments in Europe in order to seek improvement opportunities in each country under study.

- FTTP (as used by the EC) refers to FTTH and FTTB connections.

- **Defining Household and Rural Areas:** EC level definition of Rural areas exists with the proportion of NUTS3 (*) in an area with a density of inhabitants less than 100 hb/Km².

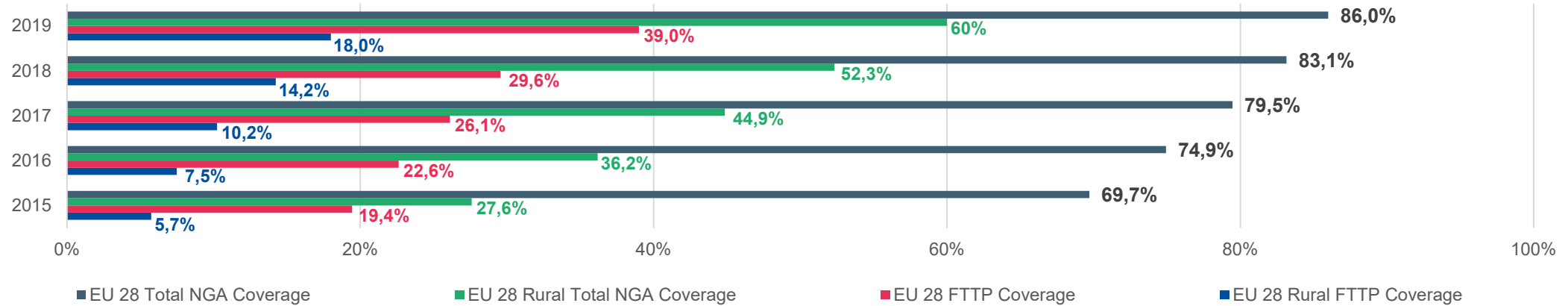
The EU Commission estimates rural households based on the population data published annually by Eurostat and average household size figures also published by Eurostat annually for each country. This approach allows the EC to maintain a unified methodology across all of the study countries using one data source (NUTS: Nomenclature of Territorial Units for Statistics)

Many areas designated as Rural can contain higher density locations that can be served via FTTH in an economical way.

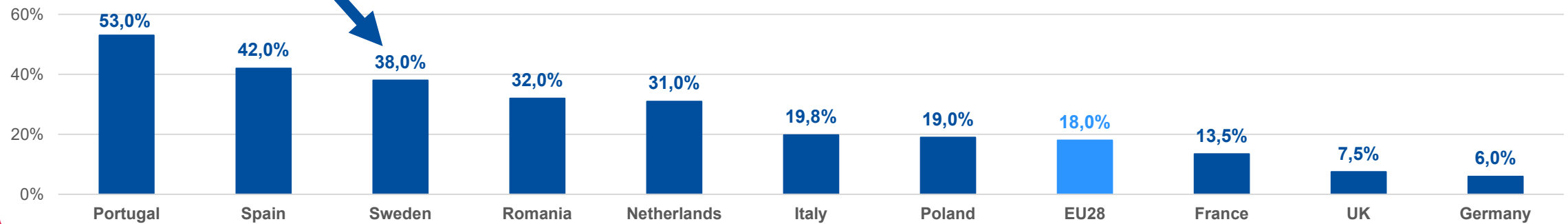
Europe is committed to reach non dense areas with high speed networks

Huge discrepancies between countries

EU28 coverage evolution in terms of: Rural FTTP, Total FTTP, Rural NGA and Total NGA



Rural FTTP coverage, Countries under study vs EU28 (est. 2019)



Source: European Commission, Regulators, IDATE

05 | Key Conclusions

Indicators affecting the FTTH adoption

Positive criteria



Data and bandwidth continues to grow, more operators and governments are working towards future proofed FTTH deployments



During 2019, more governments launch subsidy programmes to reach new FTTH areas, including rural regions



More operators migrate towards FTTH, they are focusing on copper switch-off and cable migration towards full-fibre



The trend of mutualized networks and network sharing agreements will accelerate FTTH deployments



New initiatives defined by European governments to reach Digital Agenda goals by 2025

Indicators affecting the FTTH adoption

Negative impacts



FTTH investments delayed due to alternative technologies such as Cable (Docsis 3.1) and G.Fast



Misleading Fibre advertising suppresses demand



Fixed-wireless and hybrid access becoming more common in isolated areas, thus delaying FTTH deployments. 5G deployments are now beginning, while high spectrum bands (26Ghz) could delay FTTH in some residential markets



Some European countries with high speed broadband goals defined do not specify specific technology such as FTTH



Lack of mass market applications to monetize FTTH deployments

Key conclusions

Public Commitment

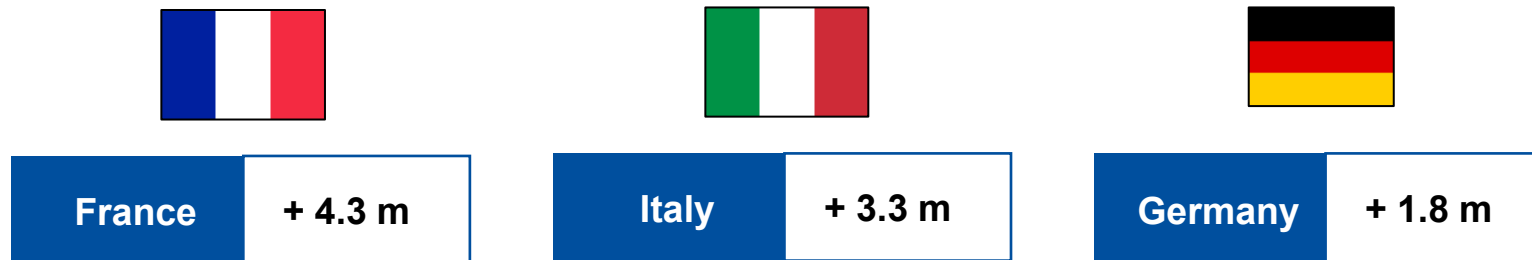
- **Government now committed to work with all telecom actors:** EC Digital Agenda implies subsidies & policy framework per country and promoted fibre expansion
- **Rural and isolated areas are now a clear target for fibre**

Regional Recap

- **Pent Up Demand clear:** Seeing large pent up demand (high connection rates) in regions that have recently started large FTTH rollouts (UK / Italy)
- **EU28 moving forward towards FTTH/B:** More implication from these countries deploy FTTH in areas not covered and also to migrate existing copper-based and cable-based towards fibre.
- **EU39 more than 172 million homes with FTTH/B, now covering 50% of total Homes**
- Countries like **Italy, Belgium, Ireland and Germany** have experienced **strong growth, homes passed up more than 30%, subscribers up more than 45%**

Top 3 - Main movers in terms of Homes Passed in absolute numbers

Data comparison between June 2019 and June 2020



Source: IDATE for FTTH Council EUROPE



06 | FTTH: Where's the Growth Worldwide?

Conclusion: Where's the Growth Worldwide for FTTH?

Short Term

- **Europe: Germany** and the **UK** : incumbents will react as Altnets and Munis are deploying.
Italy : Open Fiber rollouts and role of the Government

UK, Germany, Poland & Italy represent a reservoir of **88 millions homes** not passed today !

- **MENA**: Egypt is today starting large FTTH Rollouts (Telecom Egypt) and **KSA** with massive new cities projects
- **LATAM**: the very segmented market of **Brazil** and still **Mexico** and **Argentina** ; presence of large pan regional telcos such as **Telmex / Claro** and **Telefonica / Vivo**

Long Term

- **APAC**: the huge potential of **India** and **South East Asia**: **Bangladesh, Viet Nam, Pakistan, Cambodia,...**
- **Sub Saharan Africa**: up to **17 countries** involved in native FTTH Rollouts

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MERCI !!