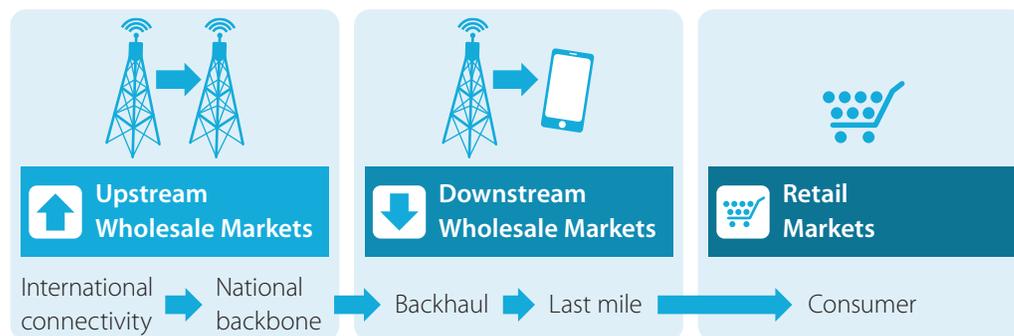


# GUIDE FOR POLICY-MAKERS

## PRO-COMPETITION MARKET SOLUTIONS TO ADDRESS KEY BOTTLENECKS IN SENEGAL'S TELECOMMUNICATIONS SERVICES<sup>1</sup>

The **TELECOMMUNICATIONS SECTOR** has been identified as a crucial pillar of future growth by the Government of **SENEGAL**. This note highlights how Senegal can benefit from **TACKLING BOTTLENECKS TO COMPETITION** along upstream and downstream wholesale telecommunications markets to unleash its full potential. It provides **POLICY RECOMMENDATIONS** for pro-competition reforms, that if implemented, could address some of the main challenges affecting the performance of the sector.

**FIGURE 1: Senegal telecommunications sector – key bottlenecks and recommendations**



### Weak framework and enforcement to encourage entry and level playing field between service-based competitors

- Pro-competition market solutions:**
- Focus regulation on markets that need it: regulated markets should meet three criteria test
  - Refocus ex ante regulation on SMP operators and alleviate the regulatory burden that falls on operators without SMP
  - Analyze effective competition to declare SMP: considering eliminating in the Telecommunications Code 25% market-share presumption of dominance
  - Ensure the technical independence of ARTP. Undertake a functional review of ARTP to identify areas to make its mandate more effective
  - Adopt the bylaws necessary to ensure the effectiveness of the Telecommunications Code to open markets to competition
  - Strengthen powers to investigate and sanction anticompetitive conduct
  - Promote a clarification or a change in regional rules regarding the competences of Senegal's authorities with powers to enforce the national competition rules
  - Develop mechanisms of collaboration both at the regional level (National Competition Commission (NCC)/ARTP with the WAEMU Commission), and at the national level (NCC, ARTP, other sectoral regulators)

### Weak framework and enforcement to promote entry by facilities-based competitors

- Pro-competition market solutions:**
- Identify services where regulation can allow for facilities-based competition or support services-based competition
  - Evaluate developing a framework for broadband support that prevents negative effects on private investment
  - Prevent cross-subsidization between competitive and non-competitive market segments. Identify PSOs.
  - Consider implementing principles of the "Ladder of investment" to accompany the entry of new players
  - Clarify the regulatory regime applicable to State-owned infrastructure to facilitate access
  - Consider regulating Sonatel's passive infrastructure under open access principles

### Spectrum management

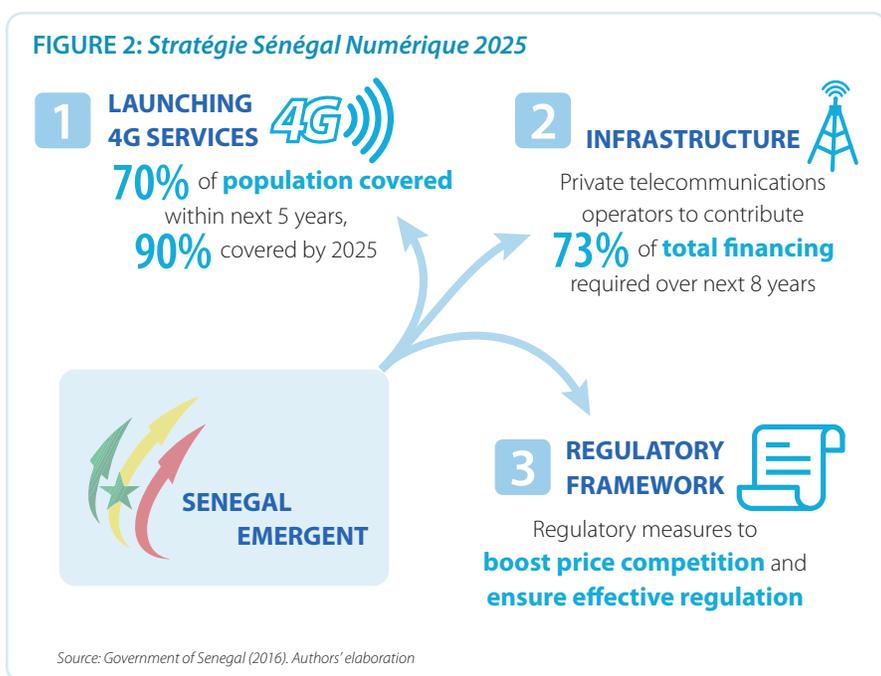
- Pro-competition market solutions:**
- Design a spectrum management policy so to facilitate the access to spectrum of those operators that will use spectrum in the most efficient way and considering technology neutrality
  - Design and adopt open competitive tenders for spectrum assignment, with provisions to allow for new entry
  - Review and reform spectrum pricing principles to incentivize efficient use of spectrum
  - Design a framework for unlicensed spectrum that can address the challenges posed by new technological developments (e.g. Internet of Things)
  - Design a package of measures and launch a process to allow for entry of a fourth mobile 4G operator

### Restrictions in competition between last mile providers e.g. ISPs and MVNOs

- Pro-competition market solutions:**
- Rationalize administrative control of entry for ISPs and MVNOs, namely by setting a general authorization regime with minimal requirements
  - Only scarce resources should require calls for tenders
  - Ensure coordination between ARTP and the Commission with Government representatives
  - There should be no decision on the number of market players when no scarce resources (spectrum) are involved

# SENEGAL'S TELECOMMUNICATIONS SECTOR: POLICY OBJECTIVES

**PRO-COMPETITION INTERVENTIONS** are important to achieve Senegal's goals for the telecommunications sector – an important direct contributor to GDP (6.3% in 2014) and enabler of other sectors. Pro-competition policies in the telecom sector can help Senegal participate in the digital economy: deploying Information and Communications Technologies (ICT) and benefiting consumers through **LOWER TARIFFS** and **IMPROVED QUALITY OF SERVICE**. Senegal's ICT strategy, the *Stratégie Sénégal Numérique 2025 (Stratégie)*, includes key objectives for the telecommunications sector (Figure 2), and is aligned with the *Plan Sénégal Emergent 2014 (PSE)*, the country's overall development blueprint. The *Stratégie* calls for **MORE INNOVATION**, with the private sector as a key driver for the development and growth of Senegal's telecommunications sector. This, however, requires a **STRONG REGULATORY AND INSTITUTIONAL FRAMEWORK** that fosters competition and enables sustainable sector growth.



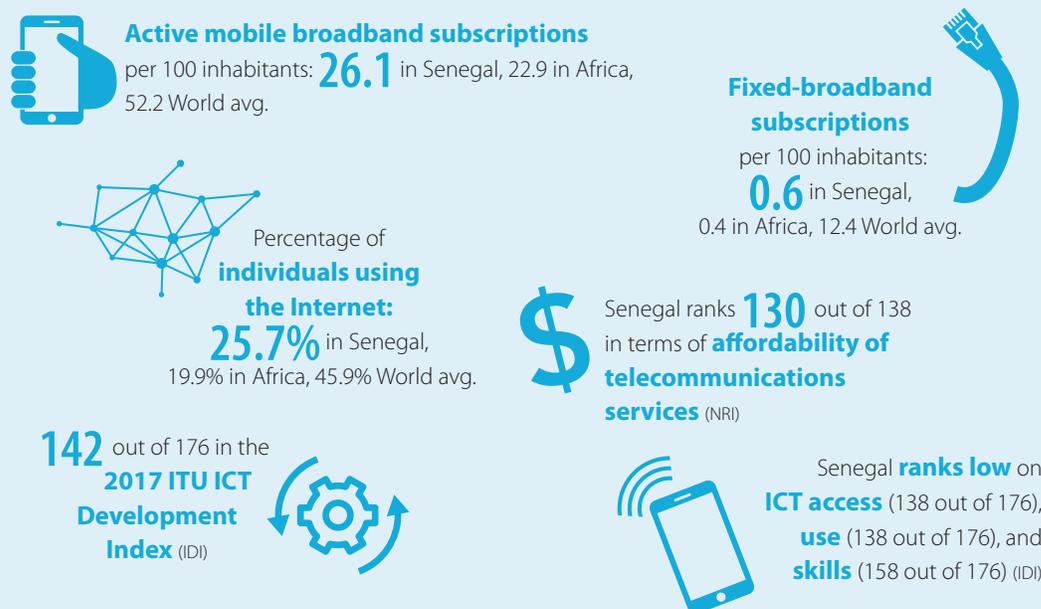
## SENEGAL'S TELECOMMUNICATIONS SECTOR HAS EXPANDED RAPIDLY IN THE LAST YEARS BUT HAS **NOT YET FULLY ACHIEVED ITS POTENTIAL**

Despite sector growth and increasing penetration, Senegal could improve its performance on the affordability of telecommunications services and penetration of broadband access to Internet (Figure 3). Senegal could take advantage of its well-developed backbone infrastructure to increase connectivity, deliver services more efficiently and encourage use.

### LIMITED AFFORDABILITY OF MOBILE SERVICES AND FIXED BROADBAND MIGHT EXPLAIN THE LOW LEVELS ICT ACCESS AND USAGE

(Figure 2). Internet penetration remains relatively low, with internet access in Senegal being below Ghana, Cote

**FIGURE 3: Senegal telecommunications sector performance**



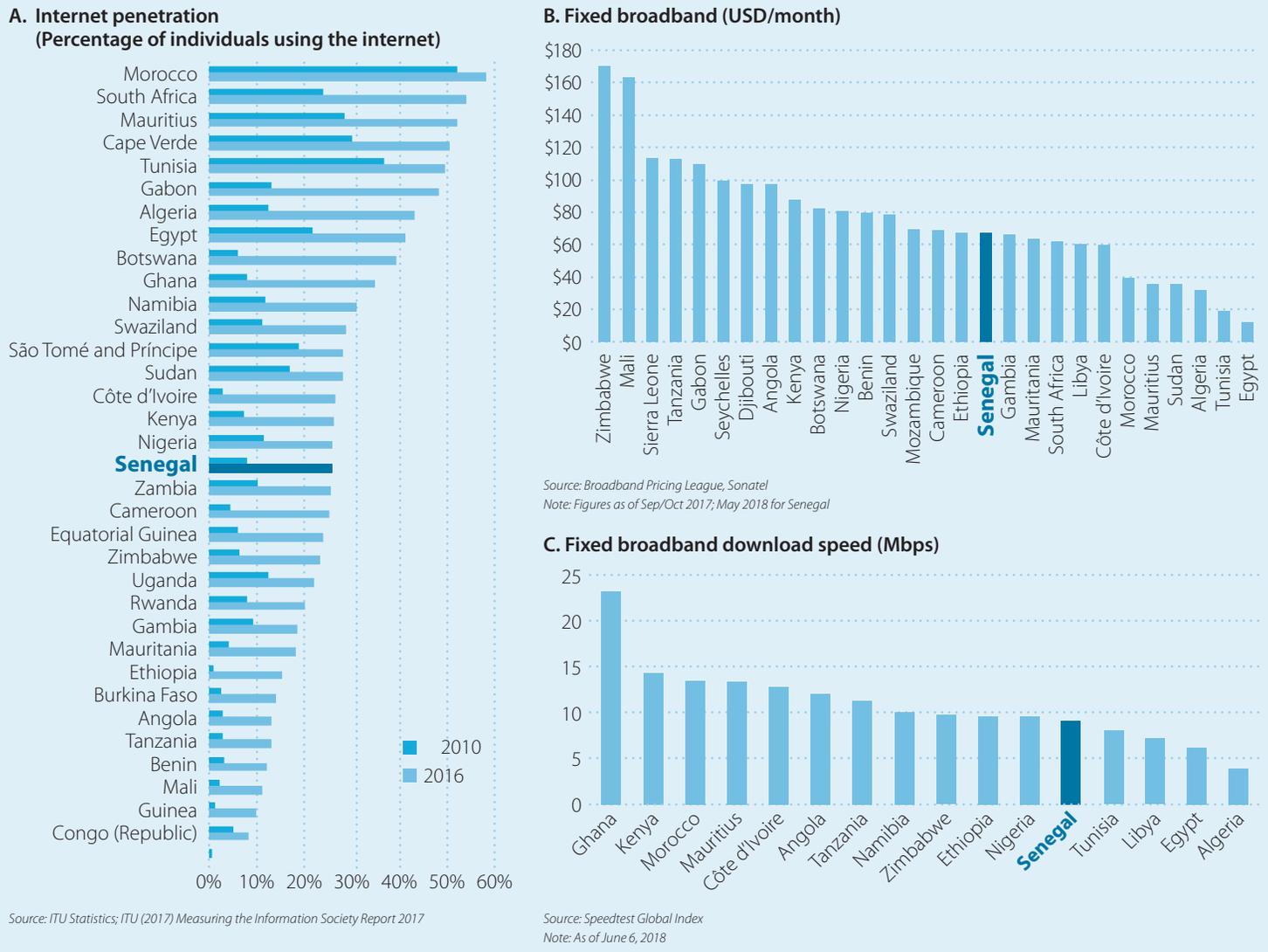
International Telecommunication Union - ITU (2017), Measuring the Information Society 2017; World Economic Forum (2016), Global Information Technology Report  
Note: 2016 figures or latest available.

d'Ivoire and Kenya (Figure 4, panel A) and fixed-broadband being very limited (0.6 subscriptions per 100 inhabitants). Broadband prices are close to the median after recent price reductions, but higher than countries in the region, such as The Gambia and Cote d'Ivoire (Figure 4, panel B). However, download speeds (Figure 4, panel C) are on the low side and international internet bandwidth per Internet user is less than one tenth of the average for Africa, affecting the quality of connectivity.

Limited affordability of mobile services and fixed broadband might explain the low levels ICT access and usage (Figure 2). **INTERNET PENETRATION REMAINS RELATIVELY LOW**, with internet access in Senegal being below Ghana, Cote d'Ivoire and Kenya (Figure 4, panel A) and **FIXED-BROADBAND BEING VERY LIMITED** (0.6 subscriptions per 100 inhabitants).

**BROADBAND PRICES ARE CLOSE TO THE MEDIAN** after recent price reductions, but higher than countries in the region such as Gambia and Cote d'Ivoire (Figure 4, panel B). However, **DOWNLOAD SPEEDS** (Figure 4, panel C) **ARE ON THE LOW SIDE** and international internet bandwidth per Internet user is less than one tenth of the average for Africa,<sup>2</sup> affecting the quality of connectivity.

**FIGURE 4: Market outcomes in the telecom sector in Africa: Senegal and other countries**



## COMPETITION ALONG TELECOMMUNICATION VALUE CHAINS IS IMPORTANT TO ACHIEVE POLICY OBJECTIVES

Opening mobile and international calling markets to more competition can have an important impact on access, usage and prices (Figure 5) and help Senegal achieve the PSE's objectives.

**FIGURE 5: Benefits of opening telecommunications markets to competition**

In a sample of **40** African countries entry of an additional operator led to a **57% increase in mobile subscriptions** (2002, Gebreab)



Opening up international calling services to competition can **increase call volumes** by up to **104%** (2012, GSMA)

Opening up international calling services to competition can **reduce prices** by up to **90%** (2012, GSMA)



Sources: Gebreab 2002, Groupe Spéciale Mobile Association (GSMA) 2012

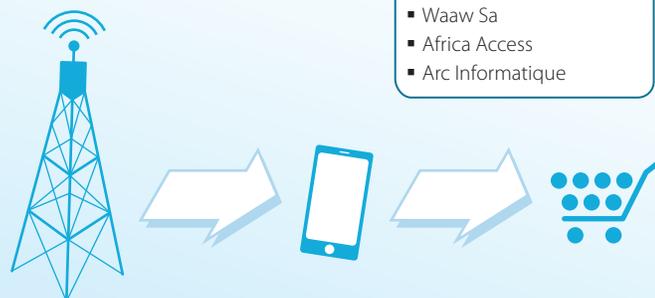
# THE AFFORDABILITY AND QUALITY OF SERVICES DELIVERED TO CONSUMERS DEPEND ON THE FUNCTIONING OF VARIOUS MARKETS ALONG TELECOMMUNICATIONS' VALUE CHAINS

Senegal's value chain for telecommunications (both service and facilities-based), and the key market players along the value chain are summarized in Figure 6. The telecommunications value chain has 3 key segments consisting of different interconnected markets:

FIGURE 6: Senegal telecommunications value chain and key players



A functioning telecommunications value chain would require dynamic market conditions and pro-competition regulation at all levels, that respond to each market's characteristics that make it more prone to significant market power by an operator and potential anticompetitive practices. The telecommunications sector is characterized by disruptive technology and continues to evolve at a fast pace. Technology changes lead to constant innovation and evolution of services and markets, which creates new rivals and shifts the economic strength of existing rivals. Therefore, the boundaries of telecommunications markets need to be reassessed periodically. Telecommunications markets are characterized by significant fixed costs and sunk investments, economies of scale and scope, essential facilities and network bottlenecks, and a reliance on scarce resources, including spectrum. Entrants in some segments face high fixed costs due to upfront investments in infrastructure, as well as commercial investments in sales and distribution channels. These high initial fixed costs, particularly in upstream segments, give incumbents a strategic advantage over new entrants, because the latter have fewer clients to spread their fixed costs. Furthermore, some infrastructure cannot be economically replicable and is essential in allowing for competition in downstream markets. Regulators can respond to these characteristics in several ways.



# CHARACTERISTICS AND MARKET DYNAMICS OF SENEGAL'S TELECOMMUNICATIONS SECTOR

Market outcomes are the result of the interaction between market players under a given regulatory framework. The extent to which rules prevent entry, expansion and competition on a level playing field contributes to suboptimal outcomes. Senegal places in the bottom half of comparator countries according to product market regulation (PMR) indicators<sup>3</sup> (Figure 7). This score is in part a reflection of restrictions on entry, lack of clear rules that strengthen the governance of companies with government shareholding and ensure competitive neutrality, and high concentration levels. In addition, the regulatory framework has not contributed to boosting service and infrastructure-based competition (e.g. no pro-competitive radio spectrum management and weak access regulation framework).

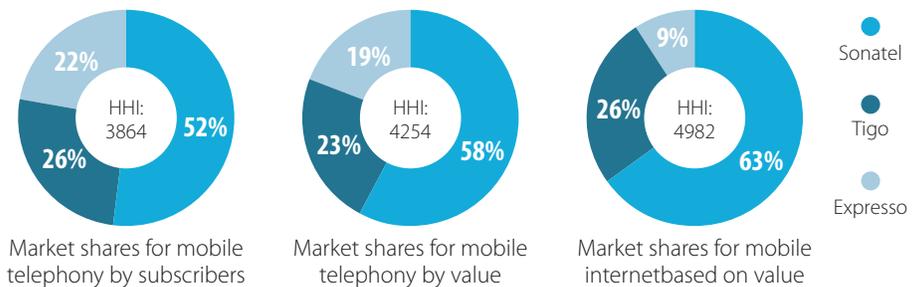
Although concentration in mobile markets has declined over time, it is still relatively high compared to other countries. The Herfindahl-Hirschman Indices (HHI) for Senegalese mobile markets are comparatively high<sup>5</sup> (Figures 8, 9 and 10). These HHI numbers are also high compared to peer countries (Figure 11). While it is not unusual for certain telecom market segments to be concentrated, some segments in Senegal have become more concentrated over time. For example, whilst in the late 1990s there were more than 15 internet service providers (ISPs), only four are in the market today. This is primarily because, until 2017, ISPs were subject to a cumbersome licensing regime that capped their number, and were not allowed to deploy their own infrastructure, thus having to rent Sonatel's infrastructure for excessive prices, which inevitably led to market foreclosure, and low quality of service (Figure 12). The licensing of three new ISPs can certainly boost competition although these ISPs do not compete in the same geographic area.

**FIGURE 7: Restrictions in the Telecommunications Sector by Country**



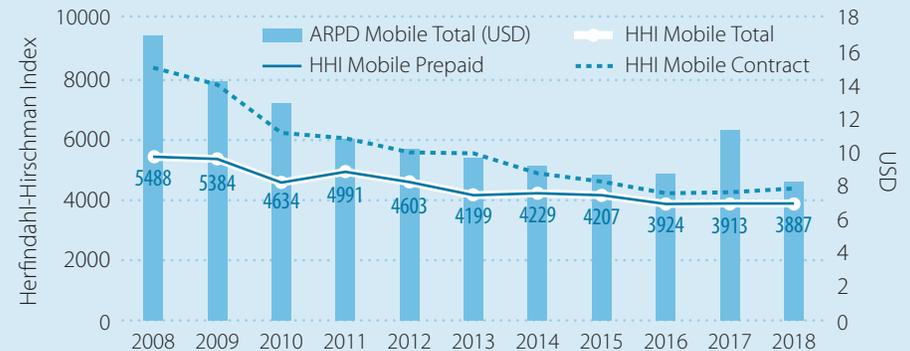
Source: Markets and Competition OECD-WBG PMR (2017)  
 Note: the top 5 performers are the United Kingdom, the United States, Malta, Poland and Italy

**FIGURE 8: Market shares of Mobile Operators as of December 2016**



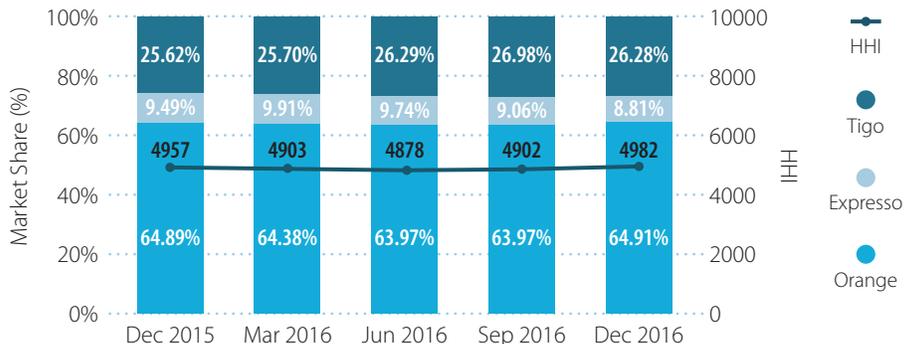
Source: ARTP (2016) and authors' estimations based on World Bank Survey

**FIGURE 9: Evolution of market concentration (HHI) and ARPU levels in the mobile phone market**



Notes: The HHI is calculated based on market shares over the number of mobile connections (subscription lines). Overtime, around 99 percent of the connections are prepaid. Recently after 2017, the share of prepaid connection slightly falls below such figure to 98.8 percent.  
 Source: GSMA intelligence

**FIGURE 10: Market share distribution among operators and market concentration index in the mobile phone market**



Source: ARTP (2016)

According to Senegal's telecommunications regulator—*Autorité de Régulation des Télécommunications et des Postes* (ARTP)—Sonatel holds significant market power in relevant markets in the fixed telephony segment (Figure 13), and also dominates all relevant markets in the mobile telephony segment (Figure 5).

In terms of access to the internet via fixed fiber network, Sonatel remains the only supplier, but three network-based ISPs have obtained licenses to operate in 3 distinct geographical regions. In this market segment, it holds 100 percent of high and low speed Internet access (ADSL). Nevertheless, according to ARTP's Internet Observatory, most users access Internet through mobile networks (98.5 percent against 1.5 percent via fixed networks), which confirms the near absence of fixed Internet connections in Senegal.

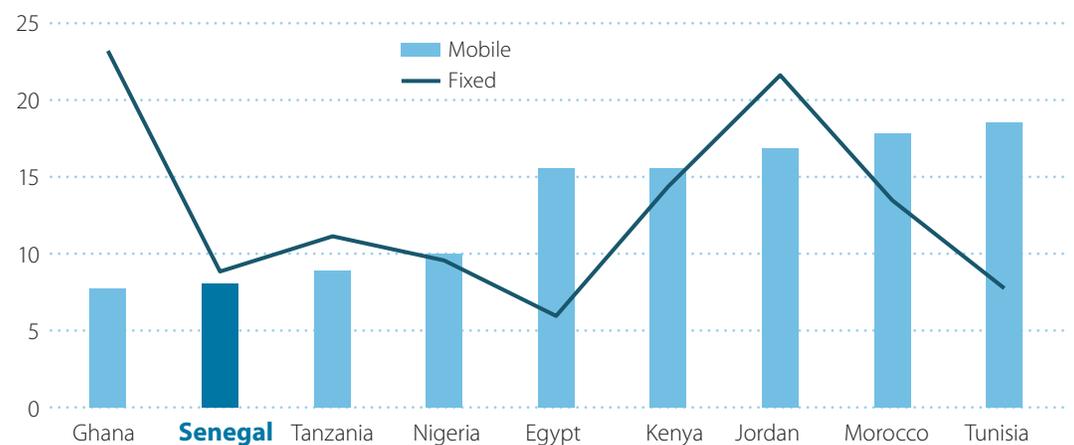
Low levels of contestability coupled with lack of adequate rules to access scarce resources managed by the government may also hinder the incentives and ability for market players to roll-out improved technologies. For instance, while 32 African countries had already developed next generation 4G networks in 2016, including neighboring countries such as Cote D'Ivoire, Ghana, Gambia, Benin (Figure 14), Senegal is still awaiting the full development of its own 4G network. By 2016, 74 4G networks were available in 32 African countries, compared to only 1 country in 2011, a trend largely missed by Senegal. Spectrum that can be used for 4G is still available in Senegal—and a plan to assign this spectrum under a process that can promote competition will be key for the effectiveness of 4G network deployment.

**FIGURE 11: Mobile market concentration in selected countries (HHI based on subscribers)**



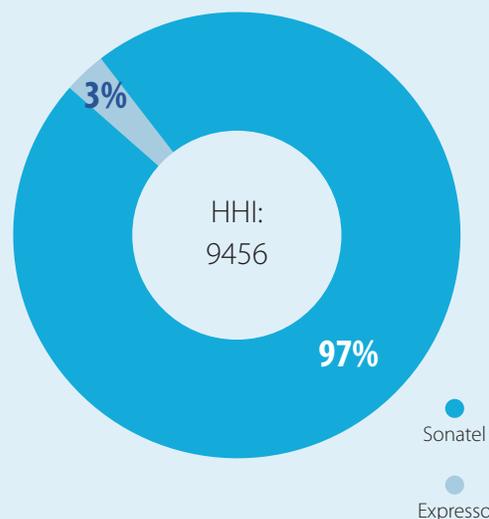
Source: ITU (2017)

**FIGURE 12: Average download speeds in selected countries**



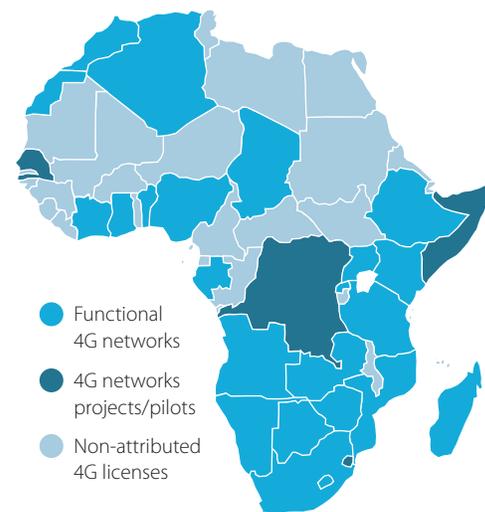
Source: ITU

**FIGURE 13: Fixed Voice Telecommunications Market Shares as of December 2016**



Source: ARTP (2016)

**FIGURE 14: Deployment of 4G networks in Africa (2016)**

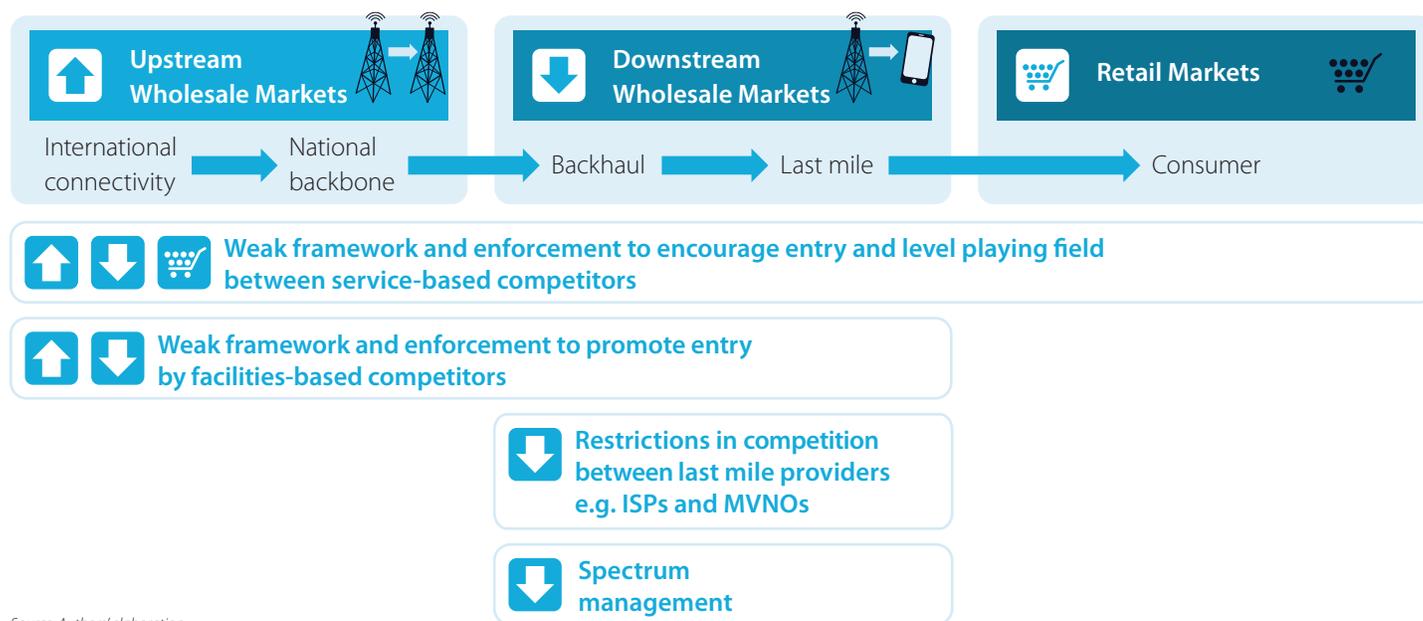


Source: <https://opensignal.com/reports/2016/02/state-of-lte-q4-2015/>

# PRO-COMPETITION POLICY RECOMMENDATIONS TO UNLEASH THE POTENTIAL OF SENEGAL'S TELECOMMUNICATIONS SECTOR

A variety of constraints affect outcomes along the telecommunication value chain and Senegal's ICT connectivity at wholesale (international connectivity, national backbone, backhaul, last mile) and retail levels. These include gaps in the framework to encourage entry and level playing field between service-based competitors, weaknesses of the framework to promote entry by facilities-based competitors, restrictions in competition between last-mile providers, and inadequate spectrum management (Figure 15).

**FIGURE 15: Key bottlenecks and restrictions to competition in Senegal's telecommunications value chain**



Source: Authors' elaboration

## 1 Framework to encourage entry and level playing field between SERVICES-BASED COMPETITORS

Senegal's telecommunications regulatory framework is characterized both by an underdeveloped ex ante regulation which is typically needed to facilitate market entry, and by an overly burdensome regulation of operators without real market power (Figure 16). During the initial phase of opening to competition, regulation is pro-active and asymmetric, as it must put into place conditions for viable entry of new operators that are capable of competing with the historical incumbent in the long run. This phase is characterized by a focus on regulation of wholesale tariffs and conditions (i.e. for access to network infrastructure and call termination services) on operators with significant market power (incumbents). Asymmetric regulation is needed to prevent abuses by those operators.

Sonatel's position as the only operator of fixed network for internet access stemmed from the 2011 Telecommunications Code licensing regime, which capped the number of ISPs until 2017, and from ineffective significant market power (SMP) regulation capable of ensuring market entry. Despite having considered that Sonatel had SMP across 12 wholesale markets, ARTP has not yet imposed obligations to grant fair, transparent and non-discriminatory access to the non-replicable infrastructure and assets owned by Sonatel (including civil engineering, such as ducts and poles). Moreover, the failures of SMP regulation have not been compensated for by an effective ex post competition law enforcement by the National Competition Commission (NCC) or by the regulator

ARTP (at the national level), nor by the West African Economic and Monetary Union (WAEMU) at the regional level.<sup>5</sup>

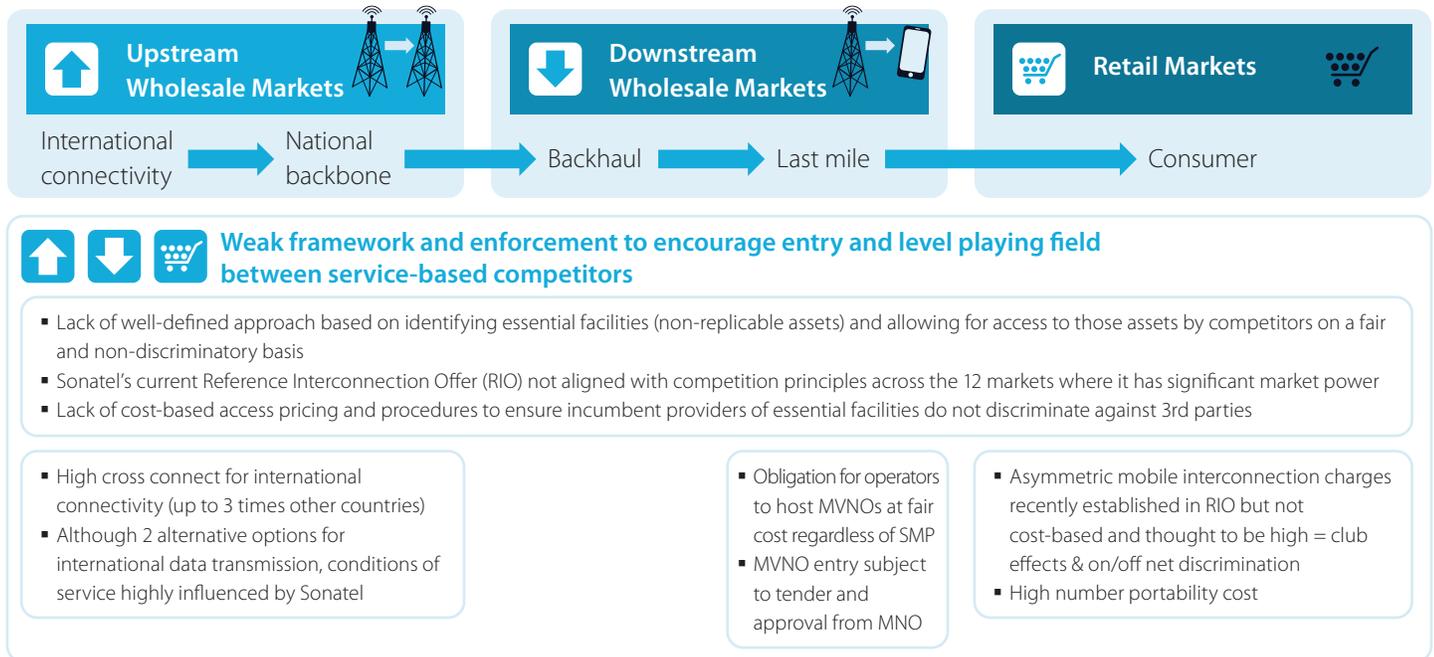
Although Sonatel does not hold a legal monopoly over international data transmission, it controls access to the main international gateway. Unclear rules to setup international gateways or landing stations and the lack of regulation for accessing the international gateway has the effect of strengthening the incumbent's dominant position in the market and is likely to contribute to the high cost of international calls and data transmission in Senegal. Countries such as Singapore have successfully regulated access to international gateways impacting connectivity.

ARTP has yet to develop rules to encourage MVNOs entry and contribution to greater access to telecom services. Rules on setting adequate charges for MVNOs and establishing asymmetric obligations of non-discrimination and transparency, together with potential obligations for operators with SMP could be considered. Senegal could also follow the example of countries where MVNOs have developed successfully under less-intrusive regulation. Generally, entry of MVNOs is subject to commercial agreements and proportionate authorization regimes; tenders for MVNO licenses are uncommon. The recent award of three licenses through tender was subject to approval by MNOs (MVNOs licenses awarded to Groupe Futurs Médias (GfM), which uses the brand You Mobile (Sonatel network), Sirius Télécoms (Tigo network) and Origines SA (Expresso network).

Although ARTP has implemented a procedure for number portability in accordance with international best practices, the results have been modest so far, indicating further regulatory challenges. This is mainly related to the high cost (10 USD) associated with number portability, which deters telecommunications operators from encouraging

number transfer.<sup>6</sup> ARTP is expected to lower the termination rates to mitigate the club effects which currently favor Sonatel's network and increase the risks of anticompetitive behavior. Going forward, it will be important that these policy changes be disseminated to make them truly effective.

**FIGURE 16: Lack of framework to encourage entry and level playing field between service-based competitors across Senegal's telecommunication sector**



Source: Authors' elaboration

Recommendations to develop a framework to encourage entry and level the playing field between services-based competitors are summarized in Figure 17.

**FIGURE 17: Pro-competition market recommendations to encourage entry and level playing field between services-based competitors**

Recommendations to encourage entry and level playing field between services-based competitors	Responsibility	Priority
<b>Focus regulation on markets that need it.</b> Markets should meet the 'three criteria test': (1) high and non-transitory barriers to entry; (2) market structure does not tend towards effective competition; (3) inadequacy of competition law to tackle market failure.	Government & Parliament	High
<b>Refocus ex ante regulation on SMP operators.</b> Alleviate the regulatory burden that falls on operators without SMP. ARTP could consider imposing obligations on operators with SMP to grant fair, transparent and non-discriminatory access to the non-replicable infrastructure and assets it owns (including civil engineering, such as ducts and poles); and (ii) continuing its policy of setting-up lower termination rates to mitigate the club effects which currently favor Sonatel's network and increase the risks of anticompetitive behavior.	ARTP	High
<b>Analyze effective competition to declare SMP.</b> Considering eliminating in the Telecommunications Code 25-percent-market-share presumption of dominance or replacing it by a rebuttable presumption of 40%.	Government & Parliament	Medium
<b>Ensure the technical independence of ARTP.</b> Undertake a functional review of ARTP to identify areas for making its mandates more effective. Ensure check and balances and implement a transparent and technical selection process to appoint Board members and the Director. Involve the President of the Republic in the selection of all Board members.	Government & Parliament	High
Adopt the bylaws necessary to <b>ensure the effectiveness of the Telecommunications Code to open markets to competition</b> (e.g. applicable costs to termination rates and charges for access to infrastructure, spectrum assignment rules and fees, integrate asymmetric regulation principle).	Ministry of Post and Telecommunications (MPT)	High
Strengthen powers to <b>investigate and sanction anticompetitive conduct</b> (e.g. margin squeeze, refusal to deal)	ARTP with support of MTP	Low
Promote a <b>clarification or a change in regional rules regarding the competences of Senegal's authorities with powers to enforce the national competition rules</b> (notably, the National Competition Commission and the ARTP in the telecom sector) vis-à-vis the WAEMU Commission.	Government & Parliament	High
<b>Develop mechanisms of collaboration both at the regional level (National Competition Commission (NCC)/ARTP with the WAEMU Commission), and at the national level (NCC, ARTP, other sectoral regulators).</b> This collaboration could involve memoranda of understanding (MoUs) on how these bodies will exercise their functions when dealing with issues involving the enforcement of competition rules, exchange of information, development and exchanging of skills and expertise, etc.	ARTP, NCC, ARMP, CRSE and WAEMU Commission	High

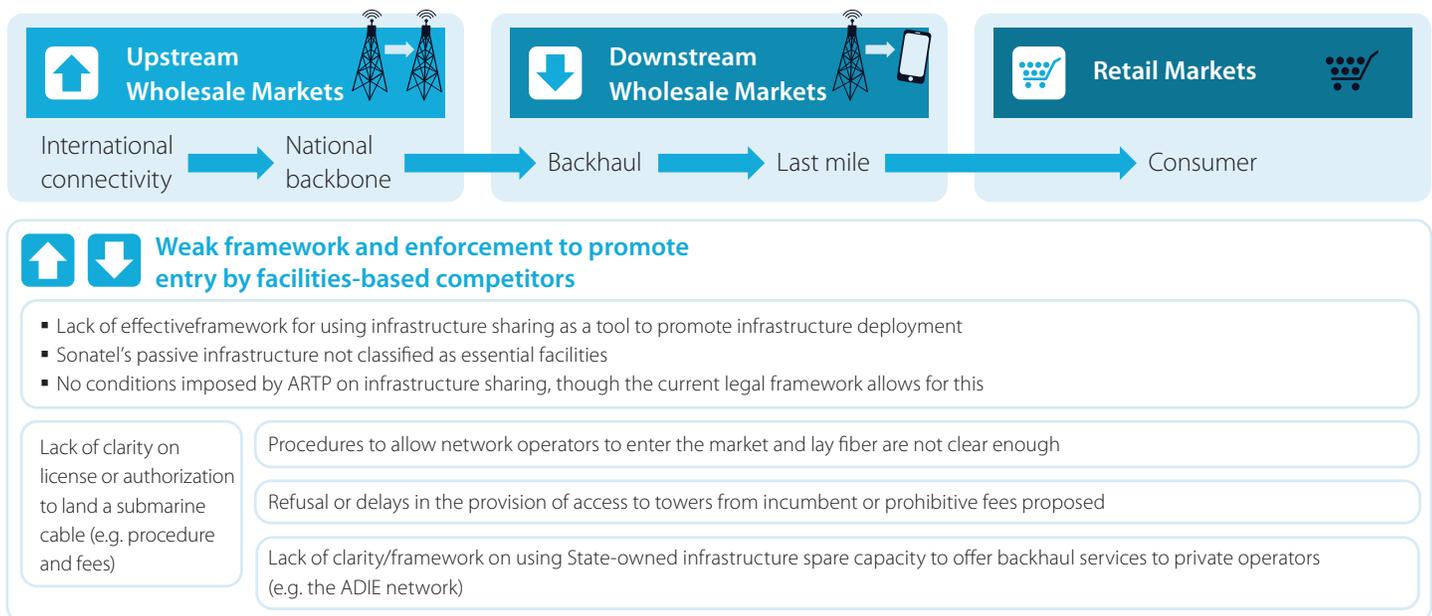
Source: Authors' elaboration

## 2 Framework to promote entry by **FACILITIES-BASED COMPETITORS**

The Senegalese telecommunications regulatory framework lacks a well-defined approach for regulating wholesale markets in such a way to encourage entry of operators that progressively develop their own infrastructure (Figure 18) and the licensing procedures have restricted entry in the past. The amendments of the Telecommunications Code are a step in the right direction to allow for entry of facilities-based ISP; nonetheless, further development is needed to streamline the process for granting an authorization for ISPs. Strengthening the regulatory framework further requires equipping ARTP with the adequate tools for identifying essential facilities (non-replicable assets) and for allowing for regulated access to those assets by competitors on a fair and non-discriminatory basis. Even though Sonatel has been declared a dominant operator, ARTP has not imposed conditions on (passive) infrastructure sharing. The Telecommunications

Code is unclear about the applicable procedure (or the cost) for setting up a cable landing station or accessing a submarine cable. Hence, although Sonatel does not have a legal monopoly over the operation of a submarine cable landing station, the absence of a clear regulatory framework in this regard increases uncertainty, thus limiting entry, and potentially reinforcing the incumbent's position. The use of government backbone infrastructure by private operators would also help operators to build a national (virtual) network for data transmission services. In fact, the current regulatory framework lacks clarity regarding the possibility of regulating access to State-owned infrastructure under the Telecommunications Code, which has led to unused digital spare capacity. In this respect, the Government and *Agence de l'Informatique de l'Etat* (ADIE) have adopted an Arrêté establishing a Committee to handle this topic.

**FIGURE 18: Lack of framework to promote entry by facilities-based competitors across Senegal's telecommunications sector**



Source: Authors' elaboration

Recommendations to develop a framework to promote entry by facilities-based competitors are summarized in Figure 19.

**FIGURE 19: Pro-competition market solutions to promote entry by facilities-based competitors in Senegal's telecommunications markets**

Recommendations to promote entry by facilities-based competitors	Responsibility	Priority
Identify services where regulation can allow for facilities-based competition or support services-based competition.	MPT	High
Evaluate developing a <b>framework for broadband support that prevents negative effects on private investment</b> .	ARTP	High
<b>Prevent cross-subsidization</b> between competitive and non-competitive market segments. Identify public service obligations.	ARTP	High
<b>Consider implementing principles of the "Ladder of investment"</b> to accompany the entry of new players, notably ISPs, MVNO.	ARTP	Medium
<b>Clarify the regulatory regime</b> applicable to State-owned infrastructure to facilitate access (e.g. network of the ADIE).	ARTP	Medium
Consider <b>regulating Sonatel's passive infrastructure</b> under open access principles (considering essential facilities).	ARTP	Medium

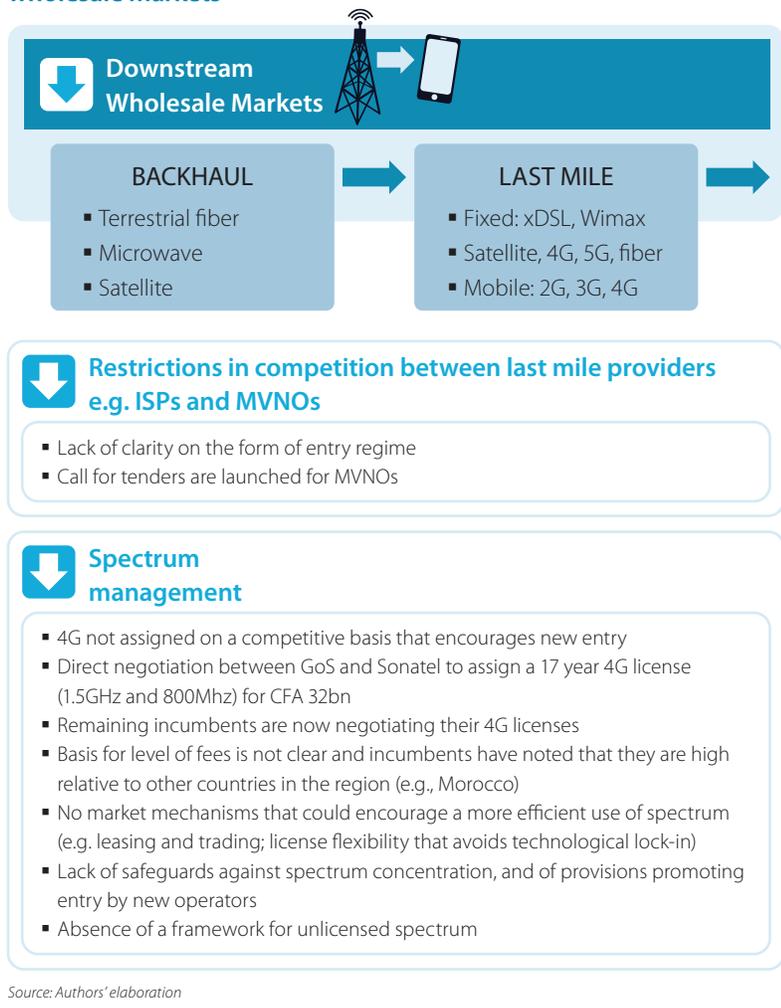
Source: Authors' elaboration

### 3 Restrictions in competition between LAST MILE PROVIDERS

Although the licensing regime has been amended and some absolute restrictions on entry have been lifted, the procedure is not as open and streamlined as in various other jurisdictions (Figure 20). All telecommunications networks and services open to the public, that are based on scarce resources or use the public domain, are subject to a licensing regime under the Telecommunications Code.<sup>7</sup> Even though Law 2017–13 from 20 January 2017 replaced the licensing regime for ISP by an authorization regime, which allows operators to deploy and operate their own infrastructure, the way in which this regime is designed may still limit entry. Furthermore, as it stands, the scope of the licensing regime is still overly broad, imposing the adoption of a tender and a cumbersome procedural regime for activities that could be subject to a mere authorization regime, notably for the MVNOs.

Recommendations to boost competition between last mile providers are summarized in Figure 21.

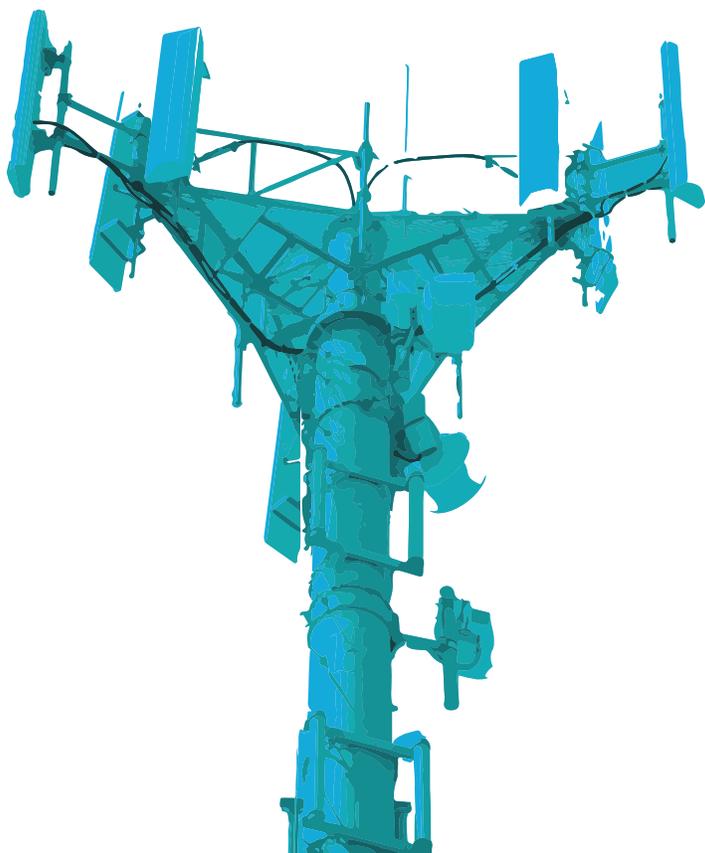
**FIGURE 20: Restrictions to competition in Senegal’s downstream wholesale markets**



**FIGURE 21: Pro-competition market solutions to boost competition in Senegal’s downstream wholesale telecommunications markets**

Recommendations on boosting competition between last mile providers e.g., ISPs/MVNOs	Responsibility	Priority
<p><b>Rationalize administrative control of entry for ISPs and MVNOs.</b></p> <ul style="list-style-type: none"> <li>▪ The scope of the authorization regime should be broadened so that it applies to all administrative procedures where no scarce resources, such as frequencies, are involved. Market entry by MVNOs should only be subject to a general authorization regime.</li> <li>▪ Continue the process of streamlining entry by setting a general authorization regime with minimal requirements at any time for the facilities-based or services-based operators without quantitative limitations, geographical restrictions and undue technology restrictions.</li> <li>▪ Only scarce resources (e.g. frequencies), some infrastructure segments and some areas (low density) (which would be identified by ARTP after in-depth specific analysis) require calls for tenders.</li> <li>▪ There should be no decision on the number of market players when no scarce resources (spectrum) are involved.</li> <li>▪ Ensure a technical and agile coordination between ARTP and the Commission with representatives from the Government and the President of the Republic.</li> </ul>	MPT and ARTP	High

*Source: Authors' elaboration*



## 4 Inadequate SPECTRUM MANAGEMENT

Senegal has not yet deployed a full 4G network, despite there being adequate radio spectrum, and has not assigned radio frequencies competitively. So far, only Sonatel, has been awarded frequency rights to deploy a 4G network. This assignment resulted from a direct negotiation between the Government and Sonatel concerning the renewal of its global license (fixed and mobile) in 2016 following a failed attempt to assign spectrum competitively. The awarding of rights to deploy a 4G network through direct negotiation with the incumbents can lead to inefficient outcomes since it can strengthen the main operator's market power and weaken its competitors. Granting access to spectrum to those operators that will use spectrum in the most efficient way is important to benefit from wireless broadband technologies. For this, it is important to ensure a competitive selection process that minimizes potential negative effects on competition either by granting a first-mover advantage to an operator or applying methods that can alter the competitive environment and reinforce dominance. It is also important that spectrum fees are clearly calculated, and that their value is aligned with other countries from the region, in order to foster

market entry and limit the risks of MNOs passing-on the costs incurred to consumers. Safeguarding against concentration of spectrum in the hands of a few players would also allow for a more efficient use of spectrum. No spectrum licenses have been assigned to newcomers, but given available spectrum, Senegal could benefit from reassessing its spectrum management policy and optimize its use for the delivery of current and future services. In tandem, Senegal could also benefit from the introduction of market-based mechanisms that could encourage a more efficient use of spectrum, namely by opening the possibility for spectrum trading and leasing, subject to ARTP's monitoring, and by increasing the flexibility of ARTP's licenses by not locking them to a specific technology, unless necessary for interference reasons. Furthermore, in light of recent technological developments, such as the Internet of Things, which rely on unlicensed spectrum, it is increasingly important to assess the introduction of a framework governing unlicensed spectrum.

Recommendations to strengthen spectrum management in Senegal's last mile services are included in Figure 22.

**FIGURE 22: Pro-competition market solutions to strengthen spectrum management in Senegal's downstream wholesale telecommunications markets**

Recommendations on strengthening spectrum management	Responsibility	Priority
Design a spectrum management policy so to <b>facilitate the access to spectrum to those operators that will use spectrum in the most efficient way</b> and considering <b>technology neutrality</b> .	MPT and ARTP	High
Design and adopt <b>open competitive tenders for spectrum assignment</b> , with provisions to allow for new entry.	ARTP and spectrum management agency (MPT)	High
Review and reform <b>spectrum pricing principles</b> to incentivize efficient use of spectrum – including separating management fees (based on administrative costs) from usage fees (based on either market-determined or administratively-calculated economic value); allowing for spectrum trading and leasing subject to ARTP's monitoring; and adopt more flexible spectrum licenses that do not lock operators into a particular technology (unless justified by interference reasons).	ARTP and spectrum management agency (MPT)	High
Develop a framework for unlicensed spectrum that can address the challenges posed by new technological developments (e.g. Internet of Things).	ARTP and spectrum management agency (MPT)	Medium
Design a package of measures and launch a process to allow for <b>entry of a fourth mobile 4G+ operator</b> .	ARTP and spectrum management agency (MPT)	Medium

Source: Authors' elaboration

<sup>1</sup> This note was prepared by Georgiana Pop (Senior Economist), Tania Begazo (Senior Economist), Philana Mugenyi (Private Sector Specialist), and Gonçalo Coelho (Consultant). The note summarizes key findings and recommendations of a World Bank Group Report: *Senegal: Better Markets for All through Competition Policy (July 2018)* authored by Georgiana Pop (Senior Economist), Sara Nyman (Economist), Gonçalo Coelho (Consultant), Julian Koschorke (Consultant) and Marta Camiñas Mora (Consultant) from the Markets and Competition Policy Team.

<sup>2</sup> 4,977 bit/second in Senegal versus 51,000 bit/second in Africa. Source: ITU (2017).

<sup>3</sup> Product Market Regulation (PMR) methodology was developed by the OECD. PMR indicators form a comprehensive and internationally-comparable set of indicators that measure the degree to which policies promote or inhibit competition in areas of the product market where competition is viable. PMR indicators are useful to monitor the regulatory achievements of monitored countries and to evaluate the effectiveness of policies introduced throughout the years. The PMR indicators are focused on enacted policies and not on outcomes, implying that they are 'objective,' in that they are not based on opinion surveys. Finally, PMR indicators focus on regulatory measures that affect the economy at large and can therefore be considered as comprehensive measures of regulatory restrictiveness. Their advantages notwithstanding, PMR indicators are not designed to capture informal regulatory practices nor the effective enforcement of regulations, since they are only concerned with formal compliance with a number of criteria as they are on the books; PMR data for Senegal were collected in 2017 and reflect the status of regulations as of June 2017.

<sup>4</sup> Based on the HHI, the concentration levels are classified as follows: 1) Unconcentrated Markets: HHI below 1,500, 2) Moderately Concentrated Markets: HHI between 1,500 and 2,500, 3) Highly Concentrated Markets: HHI above 2,500 (Horizontal Merger Guidelines 2010; U.S. Department of Justice and Federal Trade Commission).

<sup>5</sup> The NCC has lost national enforcement powers in favor of the WAEMU Commission in 2000. Since then the NCC may only conduct preliminary investigations and market analyses subject to the WAEMU Commissions' instructions.

<sup>6</sup> ARTP. 2017. [http://www.artpsenegal.net/index.php?option=com\\_content&view=article&id=304:communique-de-presse-la-portabilite-un-an-apres&catid=9:infos-flash&Itemid=162](http://www.artpsenegal.net/index.php?option=com_content&view=article&id=304:communique-de-presse-la-portabilite-un-an-apres&catid=9:infos-flash&Itemid=162)

<sup>7</sup> Licenses are assigned by Government decree.