



## CASE STUDY: DELIVERING AFFORDABLE INTERNET IN PERU



Valle Sagrado de los Incas in Peru, Cusco, Maras. *Credit: A. Duarte*

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## SUMMARY

Tackling connectivity challenges in innovative ways has long been at the heart of Peruvian civilisation. The Incas, whose empire was centred in modern-day Peru, defied the topography of the Andes and built the most advanced road network of the era, allowing runners to deliver messages between cities stretching from Colombia in the North, to Chile and Argentina in the South. Tourists from around the world still flock to Peru to marvel at this ancient communications infrastructure.

Today, modern-day Peru is grappling with new connectivity challenges. There are positives – connection rates in urban areas are increasing steadily, and prices are relatively low for well-off city dwellers. However, step outside the major urban areas and a different picture emerges. Just 0.3% of rural Peruvian households had access to the Internet at home in 2010. Mobile broadband – the most common access method for those living in rural areas – is also significantly more expensive than in other countries in the region.

Progressive policy steps are being taken to address these challenges. An ambitious National Broadband Plan, drafted in 2011, calls for an 11,000 km open access fibre backbone network, delivered through public-private partnerships. Steps are being taken to enhance competition in the telecommunications market, which is presently dominated by a single player. Meanwhile, the government is working hard to deliver electrification in rural areas – a necessary pre-requisite for good connectivity.

This short case study analyses the status quo in the country, and briefly identifies some of the key steps being taken to drive down the cost of Internet access for ordinary Peruvians. We hope it will be of interest and value to those working to deliver affordable Internet in Peru, throughout Latin America and indeed around the world.



## 1. THE CURRENT STATE OF CONNECTIVITY IN PERU

Accessing the Internet in Peru remains a significant challenge for the majority of the country's 30 million citizens. Despite boasting the sixth highest gross domestic product (GDP) in Latin America, Peru's Internet penetration rate is one of the lowest in the region, with only an estimated 38.2 percent of Peruvians using the Internet.<sup>1</sup> The majority of these users access the Internet in "cabinas de Internet"—community centres or private houses with local area network (LAN) connections—and household broadband penetration is growing slowly, with only about 4 percent of households online in 2011, and 5.3 percent in 2013.

A look at ITU figures for global fixed broadband subscriptions compared alongside those for Internet usage highlights the slow and limited growth of household broadband use in Peru. (See Figure 1)

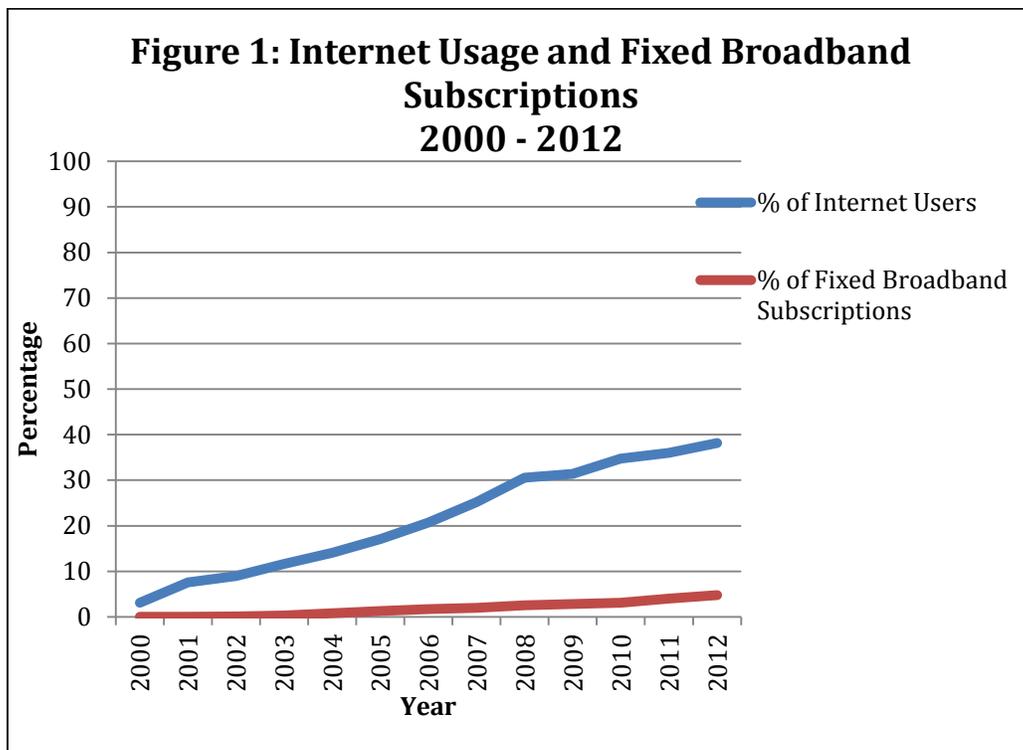


Figure 1: Internet Usage and Fixed Broadband Subscriptions 2000 – 2012

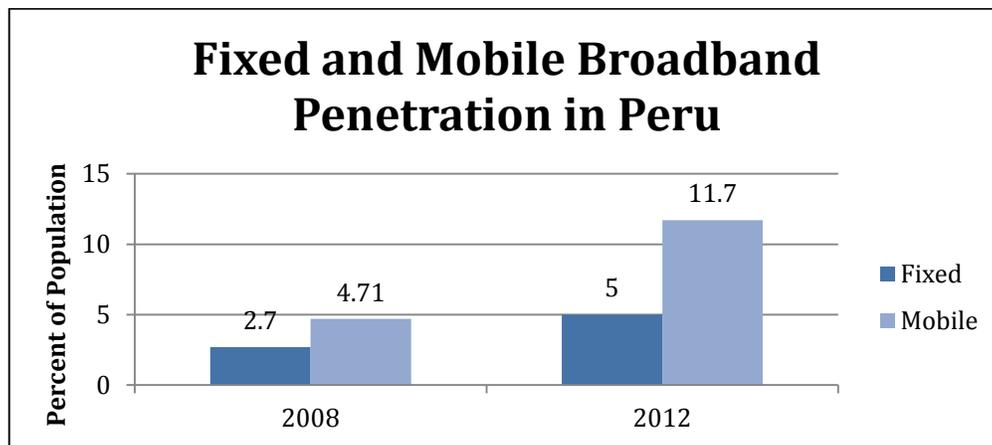
<sup>1</sup>[http://data.worldbank.org/indicator/IT.NET.USER.P2?order=wbapi\\_data\\_value\\_2012+wbapi\\_data\\_value+wbapi\\_data\\_value-last&sort=asc](http://data.worldbank.org/indicator/IT.NET.USER.P2?order=wbapi_data_value_2012+wbapi_data_value+wbapi_data_value-last&sort=asc)



## A. MOBILE BROADBAND IN PERU

Peru's mobile broadband penetration rate in 2012 was 11.7 percent—a number that, while more than double the country's fixed broadband penetration rate, still lags far behind the penetration rates found in other countries of the region, including Brazil (32.8 percent), Chile (27 percent), and Argentina (21.9 percent).<sup>2</sup> In fact, the true penetration rate is likely to be lower – about one quarter of the population have no mobile phones at all, while many Peruvians living in urban areas have multiple mobile subscriptions.<sup>3</sup>

Yet, in theory, far higher mobile broadband penetration rates should be possible. As of 2010, 95 percent of Peru's landscape is covered by a 2G network (GSM/CDMA/iDEN), and 65 percent by a 3G network (UMTS)<sup>4</sup> – with the areas that remain uncovered having a relatively low population density. It is likely that costs and lack of device penetration are holding back higher penetration rates.



**Figure 2: Fixed and Mobile Broadband Penetration in Peru**

Source: *Latin America Reports 2011 and 2013*

<sup>2</sup> [http://www.gsmamobileeconomylatinamerica.com/ENG\\_LatAmME\\_v10\\_WEB\\_FINAL.pdf](http://www.gsmamobileeconomylatinamerica.com/ENG_LatAmME_v10_WEB_FINAL.pdf)

<sup>3</sup> <http://www.budde.com.au/Research/Peru-Mobile-Market-Overview-Statistics-and-Forecasts.html?r=51#sthash.ZrEX1JWo.dpuf>

<sup>4</sup> <http://www.eclac.cl/publicaciones/xml/6/52116/BroadbandinLatinAmerica.pdf>



## B. THE URBAN RURAL GAP

Of the existing broadband connections in Peru, 83 percent are found in the capital city of Lima, which is home to around 30 percent of Peru's total population.<sup>5</sup> In 2010, 17.9 percent of urban households had Internet access, compared with only 0.3 percent of households in rural areas.<sup>6</sup> Outside of Lima, broadband penetration is significantly lower—network infrastructure is concentrated around cities along the coast, and many mountainous and jungle areas of Peru are serviced only by satellite connections. Connecting communities in Peru's sparsely populated rural areas is a significant challenge.

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<sup>5</sup> <http://newsroom.cisco.com/press-release-content?type=webcontent&articleId=262530>

<sup>6</sup> <http://www.eclac.cl/publicaciones/xml/6/52116/BroadbandinLatinAmerica.pdf>



### C. COST OF SERVICES A KEY BARRIER

Like many countries, Peru faces significant barriers to improving broadband access, including poverty, limited levels of digital literacy, rough topography, and the high cost of connecting to the Internet. While A4AI’s 2013 Affordability Report ranked Peru third out of 46 countries for communications infrastructure — a measure of the country’s infrastructure as well as the policy and regulations that support it — it ranked it 13<sup>th</sup> in access and affordability — a measure that assesses the price of services, and existing policies and regulations designed to improve levels of affordability.<sup>7</sup> This demonstrates that despite progressive policies and infrastructure, prices remain high.

Rank	Sub-index: Communications infrastructure	Sub-index: Access and affordability	Affordability Index: Overall composite score
1. Malaysia	71.6	72.2	68.6
3. Brazil	52.6	72.6	58.0
<b>4. Peru</b>	<b>61.1</b>	<b>60.8</b>	<b>56.4</b>
5. Colombia	55.9	63.6	55.0
8. Ecuador	46.6	64.3	50.1
9. Costa Rica	38.7	71.5	49.5
10. Mexico	42.6	65.1	48.2
27. Venezuela	32.6	45.3	31.7
33. Argentina	28.9	37.9	25.5
46. Yemen	11.3	9.7	0.0

**Table 1: Affordability Report Rankings. Source: A4AI Affordability Report 2013**

Broadband prices in Peru are particularly high when compared to other Latin American countries, as evidenced by the latest available ITU data.<sup>8</sup> A fixed broadband connection

<sup>7</sup> [http://a4ai.org/wp-content/uploads/2014/01/Affordability-Report-2013\\_Final-2.pdf](http://a4ai.org/wp-content/uploads/2014/01/Affordability-Report-2013_Final-2.pdf)

<sup>8</sup> [http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013\\_without\\_Annex\\_4.pdf](http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013_without_Annex_4.pdf)



in Peru costs 3.9 percent of gross national income (GNI) per capita, a price that ranks the country 80<sup>th</sup> out of 169 in terms of the price for a fixed broadband subscription. Although this is relatively cheap in comparison to some South American countries like Bolivia, where a fixed line broadband connection can cost 14.1 percent of GNI per capita, it is much higher than countries like Brazil (2 percent) or Chile (2.5 percent). Mobile broadband service in Peru is also expensive—although a 500 MB mobile broadband package is cheaper in Peru (3.2 percent of GNI per capita) than it is in Brazil (4 percent), Peruvians pay more than their neighbours in Chile (2 percent), Panama (2.3 percent), Mexico (2.5 percent), and Argentina (2.7 percent).

While these average GNI and GDP per capita measurements give a strong indication of a country's economic productivity, they do not accurately reflect income inequality and so the number of people that can actually afford an Internet connection. Peru's GDP per capita is \$10,600, but over a quarter of the country's population lives in poverty.<sup>9</sup> In 2012, 7.8 million Peruvians were living under the poverty line, and over half of those under the poverty line were living on just \$2 a day. A family living on \$2 day would have to spend 35.2 percent of their monthly income to afford 1 Mbps of broadband from one of Peru's top Internet service providers, Movistar.<sup>10</sup>

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<sup>9</sup> <https://www.cia.gov/library/publications/the-world-factbook/geos/pe.html>

<sup>10</sup> Movistar offers 1 Mbp of internet speed for 21.16 USD per month if the account is connected to a telephone plan with Movistar. <http://www.movistar.com.pe/internet/internet-fijo/tarifas>



## 2. FACTORS LIMITING THE BROADBAND REVOLUTION

### A. MARKET DOMINANCE

Perhaps the biggest challenge to driving prices down and increasing Internet and broadband access in Peru is the lack of effective market competition. This has contributed to making broadband connections in Peru amongst the slowest and most expensive in Latin America. Peruvian consumers have not witnessed the price and service competition that have led to more affordable broadband in other Latin American countries.

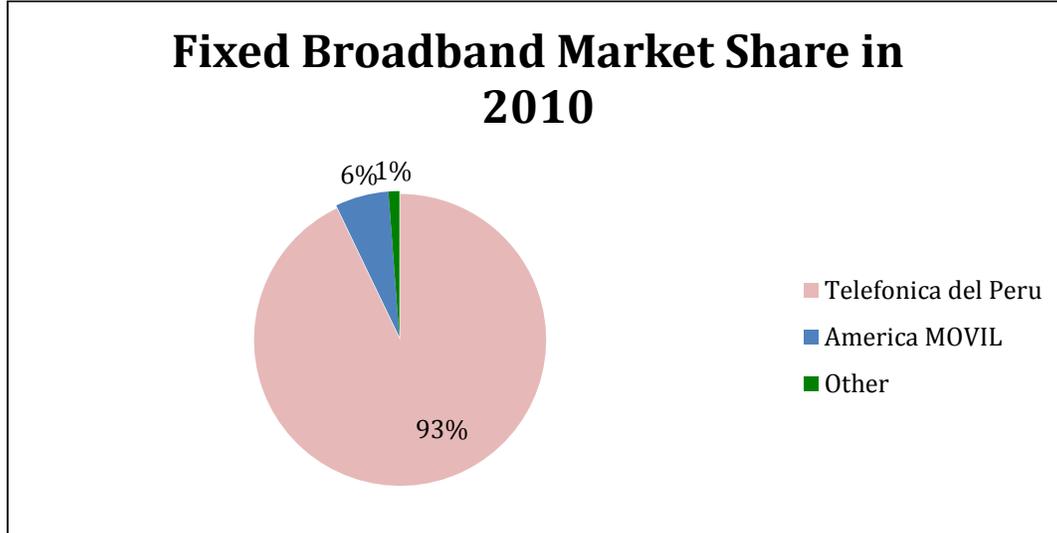
In mid-2010, the market for fixed broadband was led by Telefónica del Perú's Movistar, which held a 92.6 percent share of the market. The next largest company, America MOVIL (Claro), made up only 5.9 percent of the market, and a variety of smaller companies comprised the final 1.5 percent.<sup>11</sup> 2014 is expected to be a landmark year in competition with the introduction of the Vietnamese company, Viettel, into the telecommunications market. Yet, with Movistar's extremely strong market position, it remains to be seen how much of the market Viettel might be able to attain. Virgin Mobile also plans<sup>12</sup> to enter the market as a Mobile Virtual Network Operator (MVNO) and also plans to offer data plans.<sup>13</sup>

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<sup>11</sup> [http://www.itu.int/ITU-D/finance/work-cost-tariffs/events/tariff-seminars/elsalvador/pdf/Sesion13\\_Banda\\_ancha\\_Peru\\_Luis\\_Pacheco-en.pdf](http://www.itu.int/ITU-D/finance/work-cost-tariffs/events/tariff-seminars/elsalvador/pdf/Sesion13_Banda_ancha_Peru_Luis_Pacheco-en.pdf)

<sup>12</sup> <http://www.rcrwireless.com/americas/20111130/carriers/virgin-mobile-latin-america-confirms-licenses-in-colombia-peru/>

<sup>13</sup> <http://www.budde.com.au/Research/Peru-Mobile-Market-Overview-Statistics-and-Forecasts.html?r=51#sthash.ZrEX1JWo.dpuf>



**Figure 3: Fixed Broadband Market Share in 2010**

Source: OSIPTEL, Peru's Supervisory Agency for Private Investment in Telecommunications.

## B. ELECTRIFICATION

A frequently overlooked factor in the lack of access to Internet in Peruvian communities, particularly those in the Andean mountains and lowland Amazon jungles, is electrification. In 2005, the rural electrification rate was at just 30 percent<sup>14</sup>, making access to computers and Internet for communities in these geographies extremely challenging. Since then, the Spanish company Acciona, the EU-funded Euro-Solar program, the World Bank, and others have supported the Peruvian government in its efforts to increase electrification and provide Internet and broadband services to rural communities. There have been some notable successes. For example, the Euro-Solar program has provided solar panels for electricity, satellite Internet and laptop computer kits to 130 rural Peruvian communities, representing tens of thousands of people.<sup>15</sup>

<sup>14</sup> [http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/01/27/000442464\\_20140127095748/Rendered/PDF/ICR23580P090110C0disclosed010230140.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/01/27/000442464_20140127095748/Rendered/PDF/ICR23580P090110C0disclosed010230140.pdf)

<sup>15</sup> <http://programaeuro-solar.eu/en/>



### 3. TACKLING THE CHALLENGES

#### A. THE NATIONAL BROADBAND PLAN

The government's National Broadband Plan, developed by a multi-sectoral commission in 2011, aims to provide Internet connectivity to more remote regions of Peru by improving the country's broadband infrastructure.<sup>16</sup>

By the end of the 2016, the Plan is expected to:

- Connect 100 percent of municipalities with a minimum speed of 2 Mbps, including education centres and health establishments in urban zones, as well as police stations, government institutions, and important centres of health and education in rural zones
- Achieve 4 million broadband connections at the national level
- Achieve 500,000 broadband connections with speeds of over 4 Mbps.

A key component of the Plan, which is expected to increase household broadband penetration from 5.3 percent in 2013 to 9.3 percent in 2016, is the construction of a national fibre optic backbone.<sup>17</sup> Construction of the backbone is scheduled to begin in 2014, and is expected to reach 180 of Peru's 192 provincial capitals and cover almost 11,000 kilometres of land by its 2016 completion date.<sup>18</sup> The creation of the national backbone is expected to significantly reduce prices for basic Internet access—by some estimates, as much as 85 percent.<sup>19</sup>

To stimulate the private investment needed to provide computers and other infrastructure equipment, the Plan proposes to eliminate taxes on computer sales and to provide regulatory incentives for operators to share their networks.<sup>20</sup> One of the most common incentives for private companies in Peru to invest in rural areas is the promise of government subsidies. Peru has one of the best environments for public-private partnerships (PPPs) in Latin America, and the National Broadband Plan has created a supply of projects for new backbone deployments that can be enacted by PPPs.<sup>21</sup> Once the project is complete, the resulting national backbone will be operated by three different private Internet providers for each of the three regions (north, centre and south) of Peru.

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<sup>16</sup> [www.mtc.gob.pe/portal/proyecto\\_banda\\_ancha/Plan%20Banda%20Ancha%20vf.pdf](http://www.mtc.gob.pe/portal/proyecto_banda_ancha/Plan%20Banda%20Ancha%20vf.pdf)

<sup>17</sup> <http://www.prnewswire.com/news-releases/peru-national-broadband-plan-and-spectrum-auction-to-fuel-growth-pyramid-finds-134455818.html>

<sup>18</sup> <http://www.opticslatinamerica.org/en-us/home/news/news-articles/regional-news/april-2013/national-fiber-optic-backbone-to-cut-internet-c/>

<sup>19</sup> Ibid

<sup>20</sup> <http://www.libreriacide.com/librospdf/DTAP-274.pdf>

<sup>21</sup> <http://www.andina.com.pe/ingles/noticia-peru-among-best-places-for-publicprivate-partnerships-447132.aspx>



As mentioned earlier, at the time the National Broadband Plan was developed in 2011, Telefónica del Peru had a majority of the market share, and the connection plans it offered for 1 Mbps, 2 Mbps and 4 Mbps connections represented three of the four most expensive plans in Latin America.<sup>22</sup> Since the unveiling of the broadband plan, Telefónica has built 2,000 km of fibre optic cables to provide coverage to 20 cities in the central area of the country, as part of their Andean fibre-optic project.<sup>23</sup> Other operators are using satellite technologies to deploy broadband in Peru, with the support of the Peruvian Telecommunications Investment Fund (FITEL), which helps connect rural populations to the national backbone services. FITEL is a government-run fund that collects 1 percent of all telecommunications operators' revenues to finance telecom projects, especially in rural areas.

## B. ENHANCING COMPETITION

Improved competition will play a huge part in Peru achieving the goals outlined in the National Broadband Plan. As mentioned above, in 2011, the Vietnamese mobile network operator Viettel Group won a bid from the Peruvian private investment agency ProInversion to provide telecommunications services to Peru. It is expected that Viettel's entrance into the Peruvian market will increase competition and lower broadband prices in Peru.<sup>24</sup> Viettel, which is scheduled to begin operating in Peru later in 2014, has promised to bring lower prices than its competitors and hopes to reach 338,000 subscribers within a year. Even before the introduction of Viettel into the market, Telefónica del Peru's market share dropped 5.3 percentage points in 2013.<sup>25</sup>

Viettel won the bidding for an operating license against other international operators based on a promise to focus on the fibre optic backbone and to provide free broadband Internet access to 718 schools, clinics and selected administration offices in Peru's poorest districts by 2023.<sup>26</sup> Viettel also plans to provide more extensive 3G coverage and reduced prices for mobile broadband Internet.<sup>27</sup> This is yet more evidence that the advent of mobile broadband will play a critical role in the development and expansion of broadband in Peru over the next few years.

Furthermore, the development of 4G telecommunications networks is crucial to increasing the speed and efficiency of mobile broadband Internet connections. In addition, the increased rate of competition among providers in the mobile broadband

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<sup>22</sup> [www.mtc.gob.pe/portal/proyecto\\_banda\\_ancha/Plan%20Banda%20Ancha%20vf.pdf](http://www.mtc.gob.pe/portal/proyecto_banda_ancha/Plan%20Banda%20Ancha%20vf.pdf)

<sup>23</sup> [http://unctad.org/meetings/en/Presentation/cstd2013\\_Spitzer.pdf](http://unctad.org/meetings/en/Presentation/cstd2013_Spitzer.pdf)

<sup>24</sup> [http://www.rpp.com.pe/2013-11-08-mtc-banda-de-900-mhz-para-viettel-peru-se-desocupara-en-el-2015-noticia\\_646478.html](http://www.rpp.com.pe/2013-11-08-mtc-banda-de-900-mhz-para-viettel-peru-se-desocupara-en-el-2015-noticia_646478.html)

<sup>25</sup> <http://www.telecompaper.com/ews/telefonica-loses-broadband-tv-market-sare-in-latin-america-986505>

<sup>26</sup> <http://www.viettel.com.vn/61-0-2-2155-Viettel-taps-into-Peru-East-Timor-markets.html>

<sup>27</sup> <http://www.rcrwireless.com/americas/20130128/carriers/viettel-launch-technical-operations-today-peru/>



market than in the fixed broadband market should, in theory, create more options and flexibility in terms of pricing. Increased 4G network availability could positively impact the adoption of tablets and smartphones in Peru. In July 2013, Peru held a 4G spectrum auction, selling two blocks of frequencies to Telefónica and Entel, through their respective subsidiaries Movistar and Americatel Peru.<sup>28</sup> Entel will launch 4G and high-speed Internet services across Peru, while both companies are expected to bring 4G Long Term Evolution (LTE) coverage to around 4 to 7 million households.<sup>29</sup>

As of January 2014, 4G LTE coverage is available in seven districts of Lima.<sup>30</sup> In February 2014, Entel awarded the Chinese telecommunications equipment company Huawei a Peruvian network deployment contract to build a nationwide GSM/UMTS/LTE mobile broadband (MBB) network to cover all of Peru.<sup>31</sup> In addition, the government of Peru is planning a new auction of 4G wireless spectrum, with the frequencies to be awarded in the first half of 2014.

These are all positive developments. However, the Peruvian government and private sector must execute a strong and coordinated strategy if the benefits of mobile broadband are to be fully realised.

### C. A FOCUS ON RURAL COMMUNITIES

2013 saw increased plans announced and efforts made to provide Internet and broadband access to rural areas of Peru. In July 2013, the Ministry of Transportation and Communications (MTC) announced an auction for the Amazon Integration Project, in which the winning bidder would be licensed to provide broadband coverage to 70 rural communities in the northern region of Loreto.<sup>32</sup> In the same year, Telefónica del Peru, the largest telecom company in Peru, renewed their operating licenses under new MTC regulations. Under its renewed license, Telefónica is obligated to provide at least 12,000 free Internet broadband connections aimed at improving state services such as education and healthcare.<sup>33</sup>

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<sup>28</sup> <http://store.businessmonitor.com/peru-telecommunications-report.html#sthash.GLDGeihM.dpuf>

<sup>29</sup> <http://www.peruthisweek.com/news-peru-set-to-auction-more-4g-spectrum-100755>

<sup>30</sup> <http://www.peruthisweek.com/news-4g-lte-mobile-internet-now-available-in-seven-districts-of-lima-peru-101882>

<sup>31</sup> <http://www.cellular-news.com/story/64440.php>

<sup>32</sup> <http://www.andina.com.pe/ingles/noticia-peru-plans-to-bring-internet-to-70-rural-locations-481533.aspx>

<sup>33</sup> [http://www.mvndynamics.com/wp-content/uploads/2013/02/8a26bd4-20c2-42a7-bb8a-9e2ff8ffe78d\\_Feb2013\\_Peru\\_Final.pdf](http://www.mvndynamics.com/wp-content/uploads/2013/02/8a26bd4-20c2-42a7-bb8a-9e2ff8ffe78d_Feb2013_Peru_Final.pdf)



#### 4. BEYOND ACCESS: IMPROVING INTERNET QUALITY

For the government of Peru, improving the Peruvian Internet experience is just as important as improving access through fibre optic and mobile broadband infrastructure development. Peru understands that the demand will only be sustained if Peruvians enjoy and gain benefit from using the Internet. In 2012, the average download speed in Peru was 2.89 Mbps, nearly half the continent-wide average.<sup>34</sup> In December 2013, Peru's Supervisory Agency for Private Investment in Telecommunications (OSIPTEL) proposed a rule that would require telecommunications operators to raise the minimum guaranteed speed for both fixed and mobile Internet connections by an average of 30 to 35 percentage points.<sup>35</sup> If approved, the law allows for fines to be imposed on any company who does not meet minimum requirements and requires that the specific service no longer be marketed as broadband.

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<sup>34</sup> <http://www.eclac.cl/publicaciones/xml/6/52116/BroadbandinLatinAmerica.pdf>

<sup>35</sup> <http://www.telecompaper.com/news/peru-to-increase-minimum-internet-speed--986917>



## 5. PERU'S ROAD AHEAD

Despite rapid progress in recent years, prices remain high for many communities, and Peru has much work to do to ensure universal access becomes a reality and all Peruvians can harness the true power of the Internet. The government has recognised this and is pursuing a progressive and ambitious broadband strategy.

The success of this strategy depends on some key factors, including:

- Will the telecoms market continue to liberalise, and will the much-hyped entry of Viettel in the Peruvian market create more effective competition and choice for consumers, driving prices down?
- Will Peru create synergies between the Huawei nationwide network and the national backbone?
- With so many initiatives and demands, how can FIDEL's resources be best utilised?
- Will demand stimulation measures, like those that provide free Internet connection to schools, health facilities and selected administration buildings in Peru's poorest districts, create sustainable demand?