

Internet access spending



Mobile internet access appears to be more and more saturated

Ongoing digitisation of the economy leads to more data volume



Private as well as public investments enhancing the network infrastructure



Segment definition

Internet access spending is the market for fixed broadband and mobile access, delivered by service providers (ISPs) like Swisscom or UPC.

Fixed broadband includes wired and wireless internet connections at a fixed location. Mobile internet is accessible over cellular air interfaces via 3G or LTE (4G) networks to mobile or connected devices that use embedded modems, dongles or data cards.

Since the market for internet access and internet content are separate, neither entertainment content like music or movies nor access fees for company phones or corporate intranets are included for the internet access market calculations.

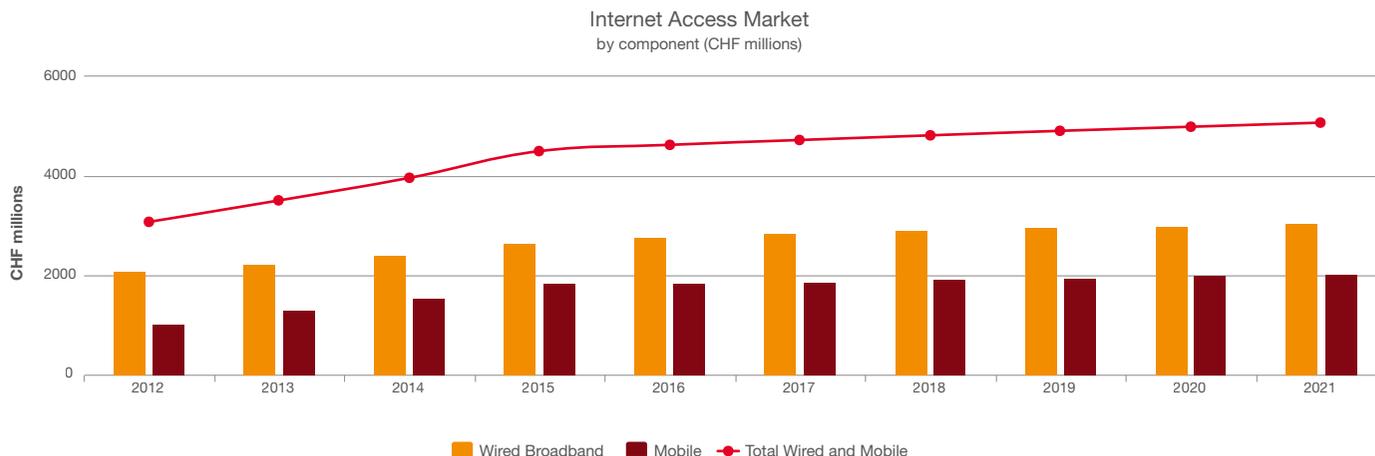
Business innovation

For many people who live in industrialised countries, internet access is an essential part of their daily life, and doing without it is not an alternative. However, at present almost half of the world's population still have no internet access, even though it is now officially deemed to be a basic human right under the non-binding resolution passed by the United Humans Rights Commission last year. The visionary department X of Google is trying to improve the current situation. The mission of the so-called 'Project Loon' is to bring internet coverage to people in rural and remote areas with specially designed balloons.

These balloons are sailing in the stratosphere at an altitude of about 20 kilometres, where the wind is stratified and speeds are relatively low. The balloon network is equipped with the necessary technology to provide interactive access to people on the ground below. By using solar power, monitoring weather conditions and analysing GPS units, a balloon is designed to last for more than 100 days in the stratosphere. Millions of kilometres

of test flights and the integration of artificial intelligence tools have led to remarkable advances in recent months. Besides using predictions of wind patterns, the balloons analyse historical data to choose the ideal wind flow and change between the layers of wind to move in the right direction in the most efficient way. As a result, LTE internet coverage can be provided where it is most needed.

Since telecommunication companies are playing an essential part in this project, several partnerships have been agreed in countries like New Zealand, Brazil and Indonesia. Thanks to these agreements, internet connectivity can be extended significantly and people can access the internet directly from their phones. In Peru, for instance, Project Loon was in the process of testing the system in collaboration Telefonica when severe weather destroyed the local ground-based network infrastructure last spring – by using this innovative technology, thousands of Peruvians were able to get online in an area roughly the size of Switzerland.



Analysis by PwC





Obviously, this technology needs further improvement before it is available on a large scale, but other companies like Facebook are testing similar ways and sharing the same vision, namely to provide worldwide internet access. This of course will not be accomplished from one day to the next; but the innovative mindset behind it all will ultimately result in many more people having access to the kind of high-quality network infrastructure that Swiss citizens take for granted.

The Swiss internet access spending market

Market overview

The Swiss internet access market consists of two distinct segments: wireline broadband access and mobile access. Since both segments were growing last year, the overall market grew by 2.8% in 2016. Expressed in absolute numbers, total revenues of CHF 4,627 million were generated.

The wireline broadband market includes different technologies like cable, **xDSL** and **fibre optic** networks. With its well-established infrastructure, Switzerland ranks among the most advanced countries in this market segment. In June 2016, more than 51% of the Swiss population had broadband internet access, the highest percentage of all OECD countries. Switzerland is also among the leaders in terms of its average connection speed (21.2 **Mbit/s** as at 16 June), the 5th best figure globally and an improvement of 27% compared to last year's speed. Even though the **transmission rates** are getting better, the costs for improvements are not being borne by customers, which is a good indicator of the stiff competition in the market. Although the prices are still high compared to other European countries, they are decreasing continuously even as the transmission rates for basic offerings are on the rise. DSL providers still dominate the market: 67% of the households were connected to the internet via xDSL (including fibre optic) versus 33% via cable. The number of Swiss households with fibre optic connectivity is increasing; the current estimate is in excess of 10%.

The mobile market, which grew rapidly over the past decade, appears to be getting more and more saturated. For the second year in a row, the number of mobile subscriptions declined by 2.2% in 2016, which is equivalent to a loss of 261,000 active SIM cards. In total, there were 11,451,000 active SIM cards in use by 8.4 million Swiss inhabitants, which led to a mobile phone connection penetration rate of 136%. A reason for the decline of active SIM cards is the increasing use of data flat rates, which enable customers to utilise several mobile devices with just a single SIM card. In addition, freely accessible WiFi hotspots in public spaces as well as in cafés and restaurants reduce the need for a second SIM card. The number of sold smartphones is still growing even though the market in Switzerland is almost saturated. According to the latest JAMES study, which is conducted by Swisscom in collaboration with the Zurich University of Applied Sciences, 99% of the youths between the



Total LTE (4G) coverage is at **98%**
for Switzerland

ages of 12 and 19 are using their smartphone with data flat rate packages to surf online.

The consequence of a high smartphone penetration combined with data flat rate packages is an enormous increase in data volume. According to Swisscom Statistics, the volume on this network alone increased by 78% last year, and the volumes are expected to grow even further. Because of that, all market players are investing millions of Swiss francs each year to continuously improve their broadband infrastructure and provide customers with state-of-the-art mobile internet access technology. Currently, the LTE coverage of the Swisscom and Sunrise networks is above 99%; Salt's coverage is 96%. However, the service providers have already started to establish the next technology: **LTE-A**. By using this technology, a connection speed up to 300 Mbit/s is possible, which makes mobile access even more convenient and attractive.



Within Switzerland, the internet Access market is dominated by a handful of companies, which are doing business in the wired as well as the mobile segment Swisscom, UPC and Sunrise are present on both markets, Salt is offering its services on the mobile market only, but is currently planning to enter the wired internet market.

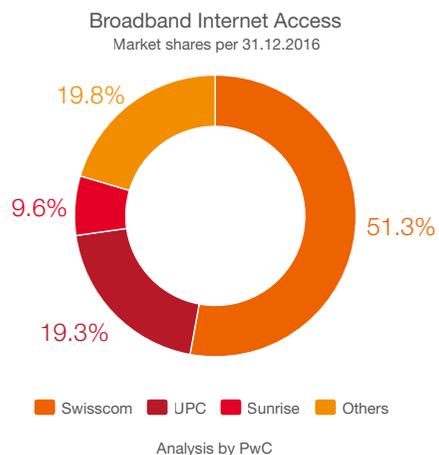
In the wireline broadband market, Swisscom is the leading company with a market share of more than 50%, followed by UPC with 19% and Sunrise with less than 10%. The rest of the market, which represents about 20%, is covered by other participants.

A similar market structure can be seen in the mobile internet access market. Even though Swisscom lost 13,000 customers in 2016, its market share increased to almost 58%. Sunrise lost 96,000 customers over the last year, which resulted in a market share of almost 26%. Salt, whose mobile network is also used by UPC subscribers, lost 152,000 customers in total and its market share decreased to less than 17%.

Principal drivers

Constant growth of data usage and volume

The fact that more data volume will be demanded and used in the years ahead constitutes the basis for future growth in both market segments. Not only are a growing number of households, smartphone users and data flat-rate packages driving this growth, but also the quality of media content and the demand for online entertainment. As the following chapters in this study will elucidate, each segment within the entertainment and media industry is affected by these developments. Whether it be for streaming music, watching movies or reading newspapers online, data volumes play a significant role in many different business models. Hence, it is not a question of the demand for internet access, but more one of being able to provide the most suitable offer to customers.



Technical improvements lead to more connectivity via the internet

Another driving force comes from the technical improvements and inventions that result in even more demand for internet access. Since an increasing number of devices, machines, cars, buildings and other items are now able to collect and exchange data, the so-called **'Internet of Things'** will require even more internet access, either via mobile or broadband. These technological advances give rise not only to more connectivity among people and physical devices, but also to more business concepts that require the internet. Smart-home gadgets, autonomous driving and smart cities will all need reliable, continuous internet access. Further technical improvements like **5G** will drive the market growth and push connectivity to levels never dreamed of. The '5G for Switzerland' programme, which was initiated by Swisscom and Ericsson in conjunction with Ecole Polytechnique Federale de Lausanne, is championing this development with the aim of enhancing Switzerland's competitiveness.



"Since people want to consume content on the run or at home, the connectivity experience of the customer is the differentiation factor among competitors providing internet access. In the end, it should not make a difference whether you are at home or somewhere else."

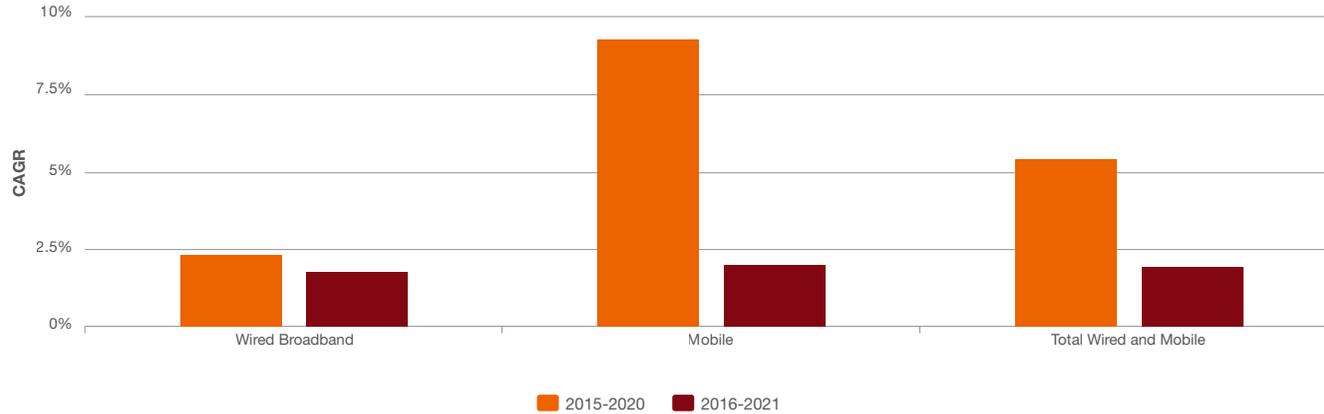
Urs Reinhard
Vice President Strategy and Business
Development | UPC

Necessity for infrastructure investments by service providers

The increasing demand for data volume, as well as the trend towards more connectivity among a variety of items, makes it inevitable that service providers will have to invest even larger sums in broadband infrastructure and their mobile networks. Although the Swiss market is already one of the most advanced, there is still room for improvement. Modern technologies like LTE-A and fibre optics are not very widespread yet, even faster connection speeds can be developed and preparatory measures for future technological standards must be taken. It can be assumed that all market players will make further infrastructure investments to keep their customers satisfied and maintain an advantageous position in this very competitive market environment. Besides that, regions and cities as well will be investing in internet access infrastructure, as this is a decisive factor in making them more attractive for companies, investors and residents. Investments of this nature are not only taking place in the major cities, but also in more rural areas like the canton of Ticino.

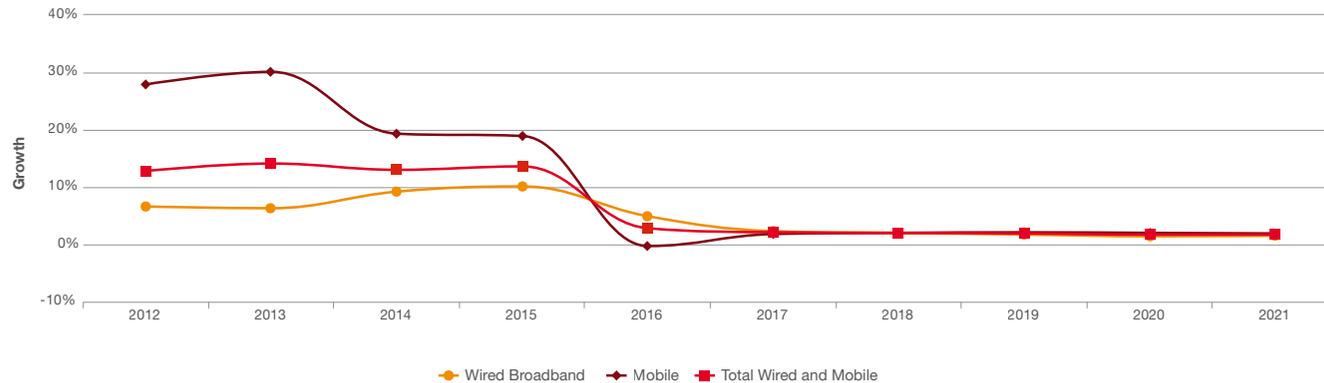


Comparison of CAGR
by component (%)



Analysis by PwC

Internet Access Market Growth
by component (%)



Analysis by PwC

Market growth

The internet access market in Switzerland continues to grow. For the forecasted time period, we estimate that the revenues in the overall market will increase at a CAGR of 1.9% to reach a total of CHF 5,075 million.

The wired broadband market can be expected to grow at a CAGR of 1.8% over the next five years. Mainly driven by the ongoing expansion of high-speed networks and infrastructure investments from Swisscom, UPC or Sunrise, the fixed broadband / wired internet penetration rate will grow slightly and lead to an even higher market saturation. The fibre optic network will expand further and gain more market share.

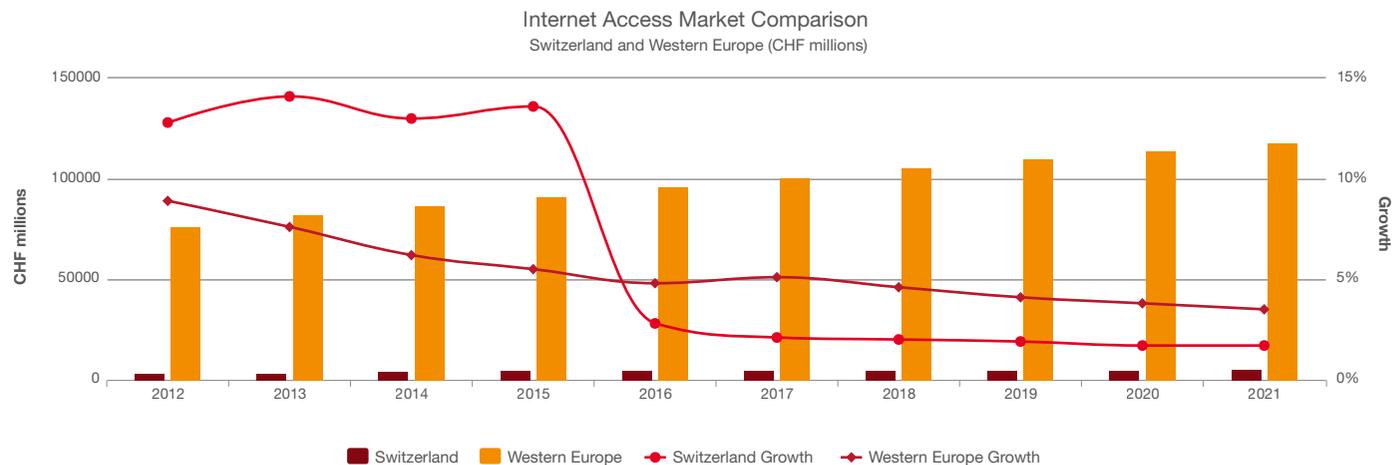
The mobile access segment is the growth engine in this market and is forecasted to grow at an average annual rate of 2.0% through 2021. Technological network improvements will be constantly implemented, and LTE-A or 5G as the future standard will make mobile internet access even faster. Due to the competition, the prices for mobile and data packages might decrease further.



Comparison to Western Europe

As the latest OECD statistics indicate, more than 51% of the Swiss populace had a broadband connection as at June 2016, the highest reading of all OECD countries. When compared with the organisation's average penetration rate of 30%, this underscores Switzerland's technological lead. Consequently, its relative growth rate is lower than that of other Western Europe countries in terms of the fixed broadband segment.

Similarly, the enormous level of mobile phone penetration, as well as the advanced mobile network coverage in Switzerland, lead to a slower relative growth rate in the mobile internet access segment as compared to most of the other Western Europe countries. Overall, the Western Europe mobile market should continue to grow steadily over the forecasted period, with smartphone penetration increasing in tandem.



Analysis by PwC

