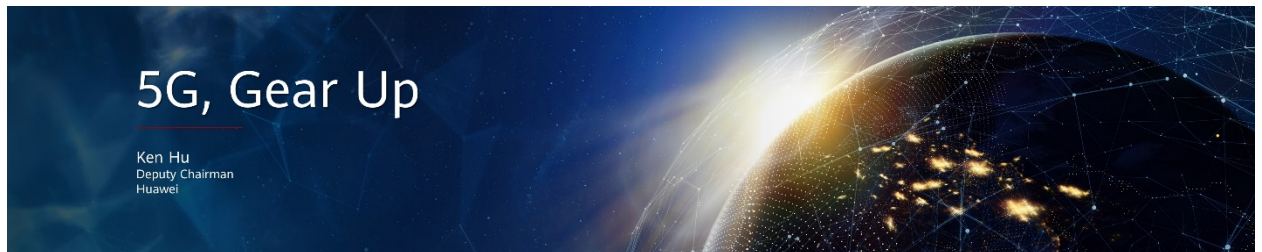


5G, Gear Up

Adapted from Huawei Deputy Chairman Ken Hu's speech at Mobile Broadband Forum (MBBF) 2019.



We've been holding MBBF for **10 years** now. Our first event was in Oslo back in 2010. In those days, our industry was rolling out 4G, and Huawei had just started exploring 5G. A lot has changed since then. Let's take a look at the **exciting progress** our industry has made in 10 years.

From 4G to 5G, we have made **incredible** progress.

But I want to talk about **next steps**. Where do we go from here, and how can we really make the most of 5G?

For me, it's about a shift in **mindset**. Not just for carriers, but for governments and vendors, too. 5G is a revolutionary technology, and we need to think about it in a **different way**. First, let's take a look at what's happening in the industry. 5G came **much faster** than we expected.

5G arrived faster than expected

In just **one year** after the standards were completed, **40 carriers** from **20** markets had launched **commercial 5G networks** around the world.

We anticipate that, by the end of this year, there will be more than **60 commercial 5G networks**.

At the same time, there has been great progress on the device side, too. By this September, there were already more than **130 5G devices** on the market, including **CPEs** and **smartphones**.

Consumers really love it

South Korea was the first market to launch commercial 5G. Let's take a look at what's happening there.

In just six months after commercial launch, there were more than **3.5 million people** using 5G services.

Data consumption is increasing significantly as well.

It is impressive that data traffic has increased by three times – to **1.3 gigabytes** per person, per day. The reason is that new VR/AR applications are boosting data usage.

Just **10 minutes** of VR consumes **4 gigabytes** of data. One minute of AR takes **600 megabytes**.

With VR/AR becoming more popular in gaming, entertainment, and education, we anticipate that traffic will reach **100 gigabytes** per person, per month very soon.

5G supercharges user experience

5G is helping to create an **amazing** user experience.

People love the speed. In Switzerland, we've already achieved speeds up to 1.5 Gbps. This is around 20 times faster than the 4G speeds available on the market right now.

People love the applications too.

In **South Korea**, you can enjoy a truly **immersive** experience in **sports** with 5G-powered, high-definition **broadcasting**.

You can use your 5G smartphone to watch a live game from **any angle** you want – 360 degrees. You can even make the camera follow your favorite player throughout the entire game.

This is a truly personalized experience.

New services like VR/AR are attracting more users. 5G-powered VR alone has attracted more than **1 million users** in less than 6 months.

At the same time, VR/AR services are encouraging more users to **upgrade to premium data plans**.

Let's take LG U+ as an example: In 2018, only **3.1%** of its subscribers were on premium plans.

After launching VR/AR services as part of the 5G premium plan, in just **three months**, premium subscribers grew to **5.3%**. That's a big jump.

5G for safer mines in China

5G is not just changing our lives. It's changing the **world**, and it's bringing exciting new applications for all industries.

Here's an example from a mine in Inner Mongolia, China. It's a big mine that uses 30 trucks to transport materials.

The mine has been facing challenges in terms of **safety, efficiency, and cost** for many years.

The working environment in the mine is **very dangerous**.

For **safety reasons**, drivers are only allowed to drive up to 10 kilometers per hour. **Efficiency** is low. They need four drivers for each truck, so **costs** are quite high.

Now we can help with 5G technology. In May, Huawei and China Mobile developed a driverless truck solution using 5G.

With driverless trucks, the mine can **save a lot** on labor costs - **\$160,000 per truck, per year**. With 30 trucks, that's big money.

Now they can travel up to **35 km/h**, not just 10.

Most importantly, because the trucks are driverless, people are no longer exposed to the dangerous working environment.

This is an **impressive use case** for 5G technology. This is just the beginning. We can expand this kind of solution to revolutionize all vertical industries.

Real challenges

Ladies and gentlemen, we've made good progress in a short time, but to make the most of 5G, we need to work together to deal with some **real challenges**.

Today I would like to focus on three of them:

Spectrum

Site resources

Cross-sector cooperation

Better, affordable spectrum

Our industry is facing challenges in terms of **supply** and **cost**.

These are **serious bottlenecks** for 5G deployment, so I would like to make some recommendations.

First, we hope governments can provide **more spectrum resources**.

We need continuous bands, large bandwidth, and at least 80 - 100 MHz for each carrier.

Governments can start **actively planning** to meet new spectrum demand for the next 5 to 10 years.

It's good to learn that some countries are already **exploring 6 GHz**. I believe that planning ahead will guide industry development and help countries gain advantages as first movers.

Second, cost. Our industry needs more support in this area as well. We hope governments can provide more reasonable cost structures for 5G.

5G will be critical infrastructure for all of society. And spectrum resources are a **fundamental part** of this infrastructure.

Governments shouldn't make spectrum too expensive, otherwise carriers will be less willing to invest.

In many countries, we're seeing positive examples where governments have helped lower costs and provide more flexible pricing models.

In China, for example, carriers are allowed to pay in installments, not make just huge upfront payments. This reduces their burden on initial CAPEX.

Saudi Arabia is another good example. The government cut spectrum costs by **25%**. In return, they raised requirements for carriers in terms of user **experience** and **coverage**.

This is a win-win for both sides – **carriers** pay less for spectrum resources and the **country** can enjoy **earlier** and **better** 5G services.

Regulatory support for site resources

Our industry needs more support on site resources.

The **cost** of site resources is still high and **site availability** always falls short of demand.

Regulators should step up and **improve** the situation by taking different measures, including **opening up** more public infrastructure for sharing and **providing guidance** on site construction.

We have seen many **good references** across Asia and Europe.

In Shanghai, the city government has set standards for multi-functional utility poles.

By the end of 2020, they will install these poles along 500 kilometers of road, which can be used to support another **30,000 extra sites**.

That's **75% more sites** than they have right now.

This will help carriers to build a strong 5G network in a big city like Shanghai.

In Germany, carriers worked with seven different ministries to identify public resources that can also be used for 5G sites, such as **traffic lights, signs, and bus stops**.

Together, they defined standards and released the guidelines in August. This will make **co-use** easier and more efficient.

In the UK, the government is working on legislation for more flexible planning regulations.

These include allowing **taller towers** for antennas in **rural areas**, so carriers can deploy **less sites** for **better coverage**.

We can all learn from these practices.

We hope to see more governments taking **proactive** regulatory measures to help carriers to build 5G networks more **efficiently** and **cost-effectively**.

Cross-sector cooperation

Finally, as an industry, we need to spend greater effort on cross-sector collaboration.

Because, in addition to **people** and **households**, 5G will also support applications for different industries.

This will open up many new market opportunities for our industry.

But we still have some challenges in terms of vertical industry knowledge, use cases, and business case development.

We can solve these challenges through more **active** cross-sector innovation.

If we can have an open mind, work together with industry partners to identify real problems and explore **what works** and **what doesn't**, that will make it easier for us to unleash the **power** of 5G.

Huawei is building out platforms to support **cross-sector innovation** on 5G. We call them **5G Joint Innovation Centers**.

In Zurich, we opened the **first** 5G Joint Innovation Center in Europe together with **Sunrise**.

Now Huawei and Sunrise are working with local partners on pilot projects for smart **farming**, smart **manufacturing**, and smart **resorts**. All powered by 5G. These are some of the domains where Switzerland is leading.

Obviously every country has its own **economic strengths**. These are the areas we can focus on and combine **5G technology** with **industry-specific** solutions to enhance their competitiveness.

We hope that these Joint Innovation Centers will help us foster a stronger 5G ecosystem **for everyone**. We look forward to building more 5G Joint Innovation Centers in Europe.

All for one, and one for all

5G is not just faster 4G. It will play a completely different role in our lives.

It's **core digital infrastructure** and a **key enabler** for digital transformation in many different industries.

As an industry, we all need to have a **fresh mindset** to drive its further development.

That includes a more **long-term view from governments** to create a more investment-friendly environment for carriers.

It also includes a **fresh mindset for carriers** to build 5G success on **innovation** and **collaboration**.

As you say here in Switzerland: All for one, and one for all!

This is Switzerland's call to action, a way of **thinking** and a way of **life** that is built on **collaboration**.

With this **mindset**, let's gear up for better 5G.