Connectivity and Education

Technical Solutions and Business Models
From copper wire to artificial intelligence

140
Years of enabling communication

78%
Of world population covered by mobile broadband (3GPP)

19
Billion connected devices in 2018

5X
Worldwide data traffic from 2018 to 2024
Ericsson at a glance

Enabling the full value of connectivity for service providers

Business areas:
- Networks
- Digital services
- Managed services
- Technologies and new businesses

By the numbers:
- 180+ countries
- 210.8 b. SEK in sales
- 95,359 employees
- 49,000 patents

Image: Ericsson headquarters, Kista, Sweden

Full year 2018 figures
Ericsson and the Global Goals

We actively contribute to all 17 SDGs, in particular, we have placed strategic importance in meeting SDG 9 (Industry, innovation and infrastructure) and SDG 17 (Partnerships for the Goals). We believe that it’s the combined power of these two which helps to differentiate our unique approach.

With expertise in Information and Communication Technologies (ICT) and long-standing industry partnerships, we have a strong platform for making decisive advances to help make the SDGs a reality.
Technology leadership with purpose

Our focus on research and innovation delivers sustainable 3G/4G/5G, IoT, Cloud and AI solutions that scale globally, so the benefits of technology become available to all.

Partnerships for progress

Only through partnerships with customers, industries, academia and international organizations, can we bring our life-changing technologies to the world at scale.
750 million people, around 10 per cent of the global population, are still not covered by mobile broadband (a 3G connection or higher).

This is known as the “coverage gap. However:

LTE increased by some 10 percent during 2018, creating the potential for around 750 million more people to utilize the technology.

The largest share of this increase came in India, which now has around 90 percent population coverage.

5G population coverage is forecast to reach 45 percent in 2024.

There are still 3.3 billion people who live within reach of a mobile broadband network but do not use mobile internet. This is known as the “usage gap.”

Source: GSMA, The State of Mobile Internet Connectivity Report 2019
How this relates to children and schools

— Globally, 29% of young people aged 15 to 24 worldwide – around 346 million – are not online.

— Young people in Africa are the least connected.

— Connectivity varies widely across the globe and within the regions.

— In Africa, the proportion of schools connected ranges from as low as 2 percent (Ethiopia) to as high as 85 percent (Mauritius). (ITU)

— Schools represent an ideal starting point for connecting young people.

— Connecting schools and utilizing them as a locus for young people’s learning and local community activities have tremendous potential for enhancing the quality of skills for young people, especially in remote areas. (UNICEF).
What can be done?

- Technology
- Policy and Regulation
- Financing Models
What can be done? Technology

Annualised cost of mobile coverage sites in rural and remote locations (relative to urban), by major component

Optimize solutions related to base stations, backhaul and energy (GSMA)

Source: GSMA, Closing the Coverage Gap 2019
What can be done? Technology
What can be done? Technology – Base Stations

Case: Entel, Chile

**Challenge**
Low expected ARPU led to minimal investments in providing rural areas with broadband

**Solution**
Utilizing the spare network resources for broadband solutions like Fixed Wireless Access (FWA) adds total capacity at minimal cost

**Impact**
Connect the unconnected schools as well as households, SMEs and their Wi-Fi-only devices using FWA

Note: This solution requires utilization of other network assets, not just base stations
What can be done? Technology - Backhaul

Case: TELE-POST, Greenland

Challenge
Poor or no rural internet access for the population
Difficult terrain and extreme environmental conditions in main populated areas.

Solution
Ericsson modernizes the TELE-POST network with cost efficient upgrade of sites to LTE also the roll-out of a backhaul microwave transport network covering distances more than 1400 km

Impact
TELE-POST could increase the customer experience by the introduction of reliable mobile broadband solutions and at the same time lower or fix the total cost of ownership for the network.
What can be done? Technology - Energy

Case: Telenor, Myanmar

**Challenge**
Power grid supply often remains the biggest challenge in maintaining coverage in remote areas, this leads to heavy dependence on diesel generators.

**Solution**
Ericsson has successfully deployed the world’s first three-technology site (2G, 3G and LTE) in three bands (900, 1800, 2100 MHz).

**Impact**
The solution runs on less than 1 kilowatt of power and the dependency on diesel energy has been removed.
What can be done?

- Technology
- Policy and Regulation
- Financing Models
What can be done? Policy and Regulation

Examples

Spectrum:
A spectrum policy that aims to improve coverage in rural areas should create incentives for MNOs to invest in network infrastructure.

Infrastructure Sharing:
Active and passive infrastructure sharing should be allowed under primary legislation and encouraged by regulators on a voluntary basis.

Policy alternatives:
E.g. USF: many USFs fail to achieve their targets due to complexities to administer and disburse the funds effectively.

Findings:
— In developed countries, high spectrum costs played a significant role in slowing the rollout of 4G networks and drove a long-term reduction in 4G network quality.
— In developing countries, spectrum prices were, on average, almost three times more expensive than in developed countries in relation to expected revenues. In these countries, high spectrum costs slowed down the rollout of both 3G and 4G networks and drove long-term reductions in network quality.

Recommendations:
— In developed countries, high spectrum costs played a significant role in slowing the rollout of 4G and drove a long-term reduction in 4G network quality.
— In developing countries, spectrum prices were, on average, almost three times more expensive than in developed countries in relation to expected revenues. In these countries, high spectrum costs slowed down the rollout of both 3G and 4G networks and drove long-term reductions in overall network quality.
What can be done?

- **Technology**
- **Policy and Regulation**
- **Financing Models**
What can be done? Financing (Business Models)

Financing Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Commercial impact</th>
<th>Scalability</th>
<th>Replicability</th>
<th>Overall suitability for rural areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage as a service (CapEx model)</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Coverage as a service (revenue-sharing model)</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Community collaboration deployment model</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Energy and connectivity business model</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
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</tr>
</tbody>
</table>

Source: GSMA, Closing the coverage gap, 2019
Background:

In July 2016, Airtel, Tigo and Vodacom agreed to implement mobile broadband enabled pilot sites and test for the first time a tripartite national roaming agreement in Tanzania, the first of its kind in Africa.

The three operators agreed to trial a network shared 3G light cost solution on 6 pilot sites (2 per operator) spread across the country.

Findings:

Mobile broadband connectivity was provided to 70,000 people for the first time

After 7 months of operation, all six sites reported healthy revenue levels

For all types of mobile services including 3G data, the pilots posted strong adoption levels.

Targeted tax incentives, adjusted regulation and improved administrative processes will be key in enabling further network expansion.