GSMA

NETWORK ECONOMICS ANNUAL REPORT

**NETWORK INNOVATION DRIVING
COST INTENSITY SAVINGS**
MARCH 2020

$1 BILLION+ CAPEX & OPEX SAVINGS FOR MOBILE OPERATORS

ENERGY

US$605M

15 Case Studies

AI & AUTOMATION

US$232M

4 Case Studies

INFRASTRUCTURE

US$255M

3 Case Studies

BACKHAUL

01
10

US$52M

4 Case Studies

About the GSMA

The GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators with over 350 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces the industry-leading MWC events held annually in Barcelona, Los Angeles and Shanghai, as well as the Mobile 360 Series of regional conferences.

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CONTENTS

FAISAL'S INSIGHTS

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*Network Economics
Lead, GSMA*

We are at the beginning of a new frontier in operator networks – massive transformation is driving them to become more agile, efficient and demand-driven and new business models are disrupting the operator's traditional models now more than ever. As 5G deployments continue and revenue opportunities are formalised, the optimisation of networks and the associated costs are an essential consideration for operators.

Over the past 12 months, the Future Networks team has been profiling 'best in class innovation' from across the globe to help operators meet these challenges – our case studies now represent over $1 billion in operator verified cost savings. Our threshold has been to seek innovation generating a minimum 1% cost intensity saving – averaging $50 million per case study. The challenge is, as always, how does one determine which innovations are guaranteed to bring significant cost savings, when every vendor will claim their solution is the best? The GSMA's Network Economics Model (NEM) allows us to quantify the benefit, and then work with operator members to validate and verify the cost savings.

This year Network Economics focused on four key areas; AI and Automation, Energy, Backhaul and Infrastructure, and you can find more details about these areas, cost optimisers and accelerators in our **Network Cost Evolution** research.

Artificial Intelligence (AI) along with IoT and 5G, are among the most talked about topics in mobile networks – though we're at the beginning of this journey with network automation rather than fully autonomous networks.

AI and Automation are more integral to mobile networks than ever before and through our use cases in China **report**, we've segmented a growing list into seven key clusters. The top three, unsurprisingly, cover network planning and deployment, network maintenance and monitoring, and network optimisation and configuration. The reality is that individual use cases themselves, may not generate significant savings individually but require the cumulative deployment of several use cases to drive greater efficiencies.

While some operators are building AI expertise within their operations, many have taken a partnership approach with smaller non-traditional vendors. Over the last few months, we have seen **Amazon**, **Google** and **Microsoft** signing deals with operators to leverage public cloud capabilities and AI and analytics capabilities in their networks – an area we look forward to investigating more in the coming months.

On the energy front, the improving economics in renewables and the global drive towards greater sustainability continues to garner support and interest. The GSMA has launched its Climate Action programme this year – the first industry-wide commitment to reach net-zero carbon neutral by 2050.

This year we have covered innovations in energy such as power purchase agreements (PPAs) from Orange Jordan and Telefonica Mexico in which they now generate 80% and 65% of their energy consumption from renewable sources. While innovative solutions from both Turkcell and Telenor reduced energy through the deployment of IoT in their base stations. Furthermore, a case study from MTN and Huawei leveraged AI and Automation to optimise the overall network energy efficiency.

NETWORK ECONOMICS CASE STUDIES SUMMARY

Full details available at www.gsma.com/futurenetworks/network-economics
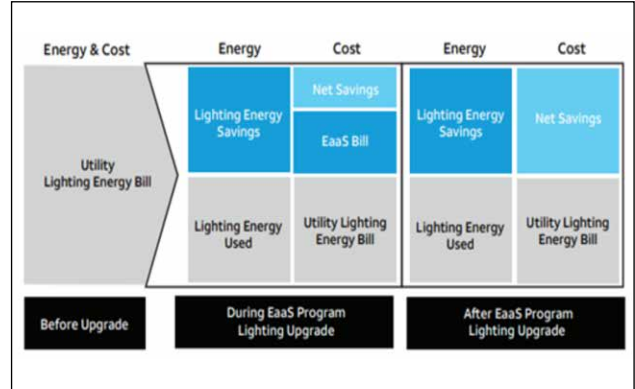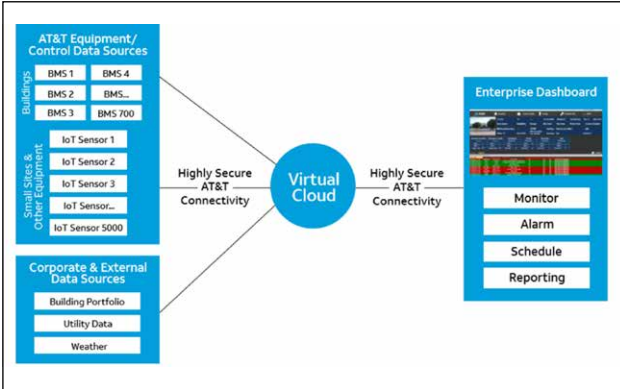
Energy

AT&T: Energy Efficient Building Management Solution (EaaS and EBMS)

The case study centres on a data-driven solution to realise energy and operations savings across a broad, distributed portfolio of buildings. AT&T uses information and data to create a scalable EaaS program that boosts the adoption of energy-efficient technologies by providing off-balance sheet, turnkey building equipment upgrades that include materials, installation, and maintenance.

In parallel EBMS is helping AT&T transform its building operations, reduce energy and maintenance costs and extend equipment life through a continuous Monitoring-Based Commissioning (MBCx) solution that incorporates Fault Detection, Diagnostics and Analytics (FDDA) capabilities.

Key Highlights:

- Deployed smart lighting systems at 647 AT&T facilities, including administrative buildings, data centres, retail stores, work centres and telecommunications equipment buildings.

- The reduced energy consumption in these facilities resulted in almost $20 million of annual avoided electricity utility payments and reduced electricity usage by 183 million kilowatt-hours (kWh).

- EBMS fault detection capabilities guides technicians to identify the root cause and resolve issues.

- EBMS can prioritise work, reduce non-productive drive time, identify invisible equipment issues, avoid costly unscheduled call-outs, and ensures network reliability by optimising the facility equipment.

Find Out More

Caban Systems: Intelligent solutions to optimise powering of communications

Caban Systems introduces a power system built from ultra-dense lithium-ion packs, capable of providing standalone power for any telecommunication site, even off-grid sites in remote areas. The power solution is cloud-connected, equipped with multitenant energy tracking, allowing exact energy usage to be correlated with individual operators. Sites with multiple operators can now be powered from one central system. This results in not only a more efficient use of assets but efficient use of energy in general. In addition to the more efficient use of energy, Caban's ultra-dense packs allow off-grid sites to be powered fully from renewable energy, reducing OPEX considerably.

Key highlights:

- Ability to combine standalone power and backup power.
- Ability to be powered by 100% renewable power.
- Reduction of diesel transport.
- Reduction of diesel use (for hybrid systems).
- Reduction in required real estate for power assets.
- Reduction in maintenance costs.
- Reduction in site visits.
- Vandalism-proof.
- Reduction in the frequency of battery replacements.

Find Out More

Orange: Solar Farms in the Desert

80% of the power produced in Jordan comes from imported diesel and fossil fuels. This incurs taxes and additional costs that could be reduced or removed if the energy is sourced from 'greener' solutions. Jordan is now seeking to beat its 2020 targets, aiming to produce 25% of its electricity from renewables. The Orange Jordan solar farm project will use Photo-voltaic panels to produce energy and will generate approximately 70GWh or 75-80% of Orange Jordan's energy consumption.

Key Highlights

- The solar energy potential in Jordan with average solar radiation ranging between 5 and 7 kWh/m^2, which implies a possibility of at least 1000GWh per year annually or 330 days of sunshine each year.
- Through a wheeling agreement, this project anticipates savings of 75-80% of the current energy bill (less the cost of generation, wheeling operations, maintenance, and government taxes, and meters monthly subscription).

Find Out More

Telefónica: Energy and Climate Change Strategy

Telefónica is committed to reducing their carbon footprint, but more significantly, they offer digital products and services that will reduce their customers' emissions.

Given its global nature, climate change is integrated into the management of the very core of the company, such as governance, risks (implementing TCFD recommendations), and setting ambitious targets. Part of the variable remuneration of the Board and all employees are associated with achieving these targets.

This climate change and energy strategy is part of Telefonica's Responsible Business Plan, headed by the Board of Directors. For over ten years, Telefonica has had a Global Energy Efficiency and Climate Change Office, comprising global areas like Operations, Environment and Procurement, in charge of implementing the strategy aligned with our core business.

Key Highlights:

- Reduce energy consumption per unit of data traffic by 85% in 2025.
- Reach 85% of renewable electricity consumption in 2025 and 100% in 2030.
- Halve emissions in 2025, reduce by 70% in 2030 and become carbon neutral, meaning zero-net emissions in 2050.
- Reduce 30% of emissions of the supply chain by 2025.
- Avoid 10 tons of CO_2 for every ton produced by 2025.

Find Out More

Telenor: Energy Efficiency in Network Transformation

Energy efficiency is a vital requirement of all business units owing to increasing equipment loads with the evolution of new technologies, and the growing price of electricity and fuel. Telenor's energy efficiency network transformation, focused upon a 5 point Energy Management Plan (EMP) to address the challenges of supply, security and sustainability.

Key highlights:

- Ensures fuel-efficient, reliable sources of power and uses more efficient generators as a backup source.
- Development of a stronger energy storage backbone through the implementation of a remote monitoring system.
- Modernisation of equipment.
- Site sharing.
- Implementing common technical and commercial KPIs and enabling smart operations.

Find Out More
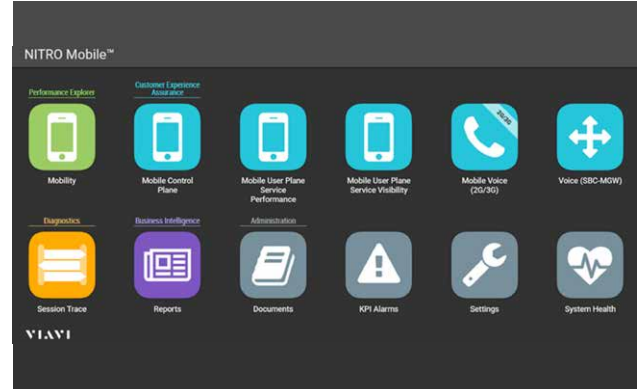
Vertiv: Energy Savings as a Service

Energy Savings as a Service (ESaaS) is a disruptive offering that will completely alter the way large operators optimise their infrastructure. Vertiv's agreement with Telefónica is to design, invest, implement, operate and maintain the infrastructure that achieves energy savings to the benefit of both organisations. The model is an attractive one from an accounting, financial and operational perspective, and importantly, removes some critical inhibitors to realising energy efficiency gains.

ESaaS requires no capital expenditure (CAPEX) from Telefónica – Vertiv effectively bears this. This insight and analytics-driven approach ensure Vertiv delivers not only innovative technologies and energy savings to businesses but also helps Telefónica to avoid CAPEX, reduce operational expenditure (OPEX) and meet commitments to environmental sustainability.

Key Highlights:

- The two key areas are thermal and power.
- As part of the ESaaS model, Vertiv optimises settings of cooling technologies, redesigns certain elements, and implements the newest free-cooling technologies.
- The MNO then pays a service fee per month, based on extensive Big Data from the site that is monitored and collected remotely, which is a percentage of the energy saving forecast.

Find Out More

Viavi: User plane analysis and Content Delivery

This case study centres on Content Delivery to the subscriber – how to provide the best experience possible for the most popular content and services while optimising the CAPEX models behind the Content Delivery Network (CDN). Also, Operators can look for new revenue models for monetising data using analytics to understand who is doing what and where on the network.

Key highlights:

- Improves website load timesby distributing content closer to the users by accessing nearby CDN servers users experience faster page loading times.
- CDNs reduce bounce rates and increase the amount of time that people spend on the site.
- Reduces bandwidth costs. CDNs reduce the amount of data an origin server must provide, thus reducing hosting costs.
- Increased content availability and redundancy. CDNs can handle more traffic and withstand hardware failure better than many origin servers.
- Website security improvement – by providing DDoS mitigation and improvements to security certificates.

Find Out More

Cellnex: DAS as a Service

This case study focuses on the cost-effective coverage and capacity solution provided with a DAS as a Service (DASaaS) concept, that enables two or more operators to use the same network infrastructure (i.e. enabling neutral host model).

Key highlights:

- The cost of a distributed antenna system (DAS) varies depending on variables such as performance and the type of venue to be covered. For buildings, in most of the cases, CAPEX of multi-operator solutions ranges between 2.5 €/m² to 12.00 €/m².

- Customer-focused engineering establishes an end-to-end approach in all areas; coverage, features, future-proofing, and cost.

- Cellnex offers flexible CAPEX and schemes to fit MNOs' financial requirements better. The Cellnex model works in a personalised way for every project, which allows costs minimisation while fulfilling all the MNOs' needs.

Find Out More

Huawei: WTTx Suite

Huawei's WTTx Suite is an innovative AI-based automation solution which facilitates the deployment/operation of WTTx. The fixed access solution uses wireless technology to provide fibre-like broadband access for more than a million household in the Philippines. WTTx Suite improves operating costs, speeds up deployment and offers easier maintenance. Huawei's WTTx Suite can assist MNOs to deploy and operate advanced features such as WTTx Maps, Post Evaluation, Abnormal customer premise equipment (CPE) Analysis and CPE Management.

Key Highlights

- CPE installation costs are reduced.

- Customers can install the broadband service themselves, reducing the to send engineers to the site.

- WTTx Suite provides a robust pre-sales evaluation of location, package and CPE.

- GEMA (Globe Enterprise Mapping Application) informs customers what packages and WTTX services areavailable and recommends a CPE.

- WTTx Suite provides graphs and maps to enable network expansion planning and remote diagnoses.

- Monitors real-time issues and identify potential problems. Approximately 90% of issues are solved through coordination.

- For a typical network with 1 million WTTx users deployed with WTTx Suite, the TCO saving can be about $20 million.

Find Out More

Huawei: AI-enabled energy optimisation solution

This case study focuses on MTN South Africa's implementation of the PowerStar solution from Huawei; an Artificial Intelligence (AI) enabled network-level energy optimisation solution, which analyses site traffic demand to improve overall energy efficiency. Trials conducted by MTN South Africa indicated that PowerStar can deliver an average network operation cost saving of 1.2%. When assessing the total MNO calculation, the PowerStar solution can provide an energy consumption saving of 11.6% per site, post-deployment with zero hardware CAPEX.

Key highlights:

- Over one day of operation, the PowerStar increased the energy-saving gain from 3.6% to 11.6%, saving 6.43 kWh per day for a single site while maintaining stable network performance.
- The PowerStar solution and commercial value are highly recognised by MTN South Africa and required to deploy on the entire network. The energy-saving benefit of the PowerStar next version is expected to reach 17%.

Find Out More

KT: Dr Lauren – AI-Based Network Failure Root-Cause Analysis solution

This case study centres on the potential of network automation enabled by AI (Artificial Intelligence). Faced with challenges of complex network operations and providing the quick resolution of issues, KT developed its network failure root-cause analysis (RCA) solution 'Dr. Lauren' in 2018. Dr Lauren is the world's first AI-based network failure RCA solution.

Key Highlights:

Dr Lauren collects alert data occurring during network operations, analyses it based on AI algorithm, big data, and automatically identifies the cause and location of network failure just within a minute.

- Incorporates KT's network management service know-how) and AI technology to ensure unprecedented analysis accuracy for identifying and locating failure cause.
- OPEX savings due to Dr Lauren are estimated to be USD 1.2M annually by providing intelligent remote monitoring and minimising failure recovery time.
- Benefits the operator by increasing customer satisfaction due to quick network failure response, where it will be easier to retain customers and improve its brand image.
- Enables the operator to provide stable services outside standard working hours, by automating network operations and monitoring.

Find Out More

PI Works: AI Use cases in Service Assurance

This case study centres on service assurance, also known as Centralised SON. The partnership with PI Works and Turkcell began in 2016 and has since marked an important milestone in the telecom industry for the largest Centralised SON project worldwide in terms of the number of modules deployed.

Key Highlights:

- Predictive Energy Saving.
- Customer-Centric Coverage and Capacity Management.
- Predictive Network Traffic Load Balancing.
- 5% reduction in power consumption with predictive energy saving.
- 17% more users experienced better streaming throughput through customer-centric coverage and capacity management.
- 42% more corrective capacity actions were taken using AI.
- 2.4% savings were achieved in the total RAN CAPEX saving.

Find Out More

SKT: Unharnessing the potential of AI for network management

With the complexity of networks increasing in the 5G era, SKT developed its AI-assisted network operations support system TANGO, which consolidates network management into one platform and enables better customer satisfaction.

Key highlights:

- TANGO provides powerful data analytics and optimised automation based on AI capabilities in real-time.
- Is manifested in its various applications, such as 3D modelling to assist Radio Access Network (RAN) planning and automatic load balancing that optimises the RAN.
- Reduces associated with network tools.
- Enables operators to monetise their network, especially for B2B customers.

Find Out More

HOW TO GET INVOLVED?

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