The Enablement Effect 2021

How can mobile tech help us reach Net Zero faster, easier, and cheaper?

#MobileNetZero
The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

We invite you to find out more at gsma.com
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GSMA Intelligence is the definitive source of global mobile operator data, analysis and forecasts, and publisher of authoritative industry reports and research. Our data covers every operator group, network and MVNO in every country worldwide – from Afghanistan to Zimbabwe. It is the most accurate and complete set of industry metrics available, comprising tens of millions of individual data points, updated daily.

GSMA Intelligence is relied on by leading operators, vendors, regulators, financial institutions and third-party industry players, to support strategic decision-making and long-term investment planning. The data is used as an industry reference point and is frequently cited by the media and by the industry itself.

Our team of analysts and experts produce regular thought-leading research reports across a range of industry topics.

www.gsmainelligence.com
info@gsmainelligence.com
Introduction

The mobile industry is at the forefront of the digital revolution, delivering impact through global initiatives. Our leaders are driving carbon eduction within their operations and enabling other industries to follow suit.

Two thirds of mobile network operators by revenue are committed to rapidly reducing their whole value chain emissions by 2030. Due to this, the industry was recognised by the UN’s ‘Race to Zero’ as one of the first sectors to ‘Breakthrough’ on net zero targets.

There is much to transform. Countries must go further, urgently, and no country should be left behind without the opportunity to deliver climate action that creates jobs, cuts emissions, and protects from climate change impacts.

This requires strong and effective global partnerships, and we are ready to engage governments, investors, and innovators. We will work together to discover what action is already being taken and what we need to reach our goals.

Smart connected technologies have a large role to play in reducing carbon emissions. This report shows not only the impact of the mobile industry reducing their emissions but also the enabling effect mobile connectivity will have in four industries – energy, manufacturing, transport, and buildings.
In 2019 the GSMA Board set an ambition for the mobile sector to reach net zero carbon emissions by 2050, at the latest.

WE HAVE MADE A STRONG START TO THE JOURNEY

We need to understand where we're starting...

...and then know where we're heading...

80% of mobile network operators* are now disclosing their climate impacts

2/3 of mobile network operators* are committed to rapidly cutting emissions by 2030

1/3 have gone further to target Net Zero by 2050 or earlier

*by revenue

This led to the mobile industry being recognised as one of the first UN Race to Zero Breakthrough Sectors

To be able to reach these goals the mobile industry needs:

1. All countries to target Net Zero by 2050 or earlier
2. Policymakers to commit to halve emissions by 2030
3. Governments to support businesses with their decarbonisation journeys
4. Investment into renewable energy and a removal of fossil fuel subsidies
Mobile enabling net zero energy

gsma.com/betterfuture/climate

To achieve net zero by 2050 we have to

* haive
  the emissions of the
  energy sector by 2030

This is

9 GIGATONNES
of CO₂ emissions

the same as taking 2
BILLION cars off the road
for a year

How much of the 9 GT CO₂ reduction by 2030 in the power sector will come from...?

...connected wind and solar power will enable

46%

of the reduction needed in CO₂ emissions by 2030

46% equals just over

FOUR GIGATONNES
CO₂ emissions

THE SAME AS 6 BILLION FLIGHTS FROM NEW YORK TO PARIS

...this equates to around

1000

coal power plants being decommissioned globally by 2030

Regional splits of CO₂ emission reductions, 2020-30

Why connected grids are better...

They outperform legacy distribution technology by balancing supply and demand in real time.

They monitor energy flows to/from grid users to evenly distribute where required in a country.

They reduce reliance on legacy fossil fuel infrastructure eg: coal, which can increase carbon emissions.

They improve grid resilience and mitigate risk of blackouts and brownouts.
Mobile enabling net zero manufacturing

gsma.com/betterfuture/climate

The manufacturing sector needs to reduce CO₂ emissions by **8.6 gigatonnes** by 2030 to be on a path to net zero by **2050**.

The GSMA have forecast smart factories will account for **16%** of the required reduction, which equates to 1.4 gigatonnes of CO₂.

The remaining portion will come from several factors, much of which are part of a ‘circular economy’.

- Use of recycled materials in production
- Re-use of waste products and base materials (steel, cement) at end of life
- Renewable energy to power factories and material construction

‘Circular economy’...and others

The GSMA have forecast that smart factories would reduce emissions that is equal to manufacturing... **140 million cars**.

Of the world’s **9 million factories** only **1%** are currently **SMART**.

Regional split of CO₂ emission reductions, enabled by mobile connectivity, 2020-30

- **NORTH AMERICA**: Share of global sector reduction **18.5%**
- **LATIN AMERICA**: Share of global sector reduction **1.2%**
- **EUROPE**: Share of global sector reduction **7.1%**
- **ASIA PACIFIC**: Share of global sector reduction **70.3%**
- **MENA**: Share of global sector reduction **2.8%**
- **SSA**: Share of global sector reduction **0.1%**

Connected factories enable integrated technology that improves productivity

IoT sensors connect machinery and production parts for analytics dynamically adjusting production on factory floor.

Connected robotics substitute manual labour, freeing up time to spend on design, innovation and other skilled tasks.

Augmented reality, virtual reality and digital twins enable remote equipment and plant maintenance.

Automated storage and retrieval systems enable better inventory management.
Mobile enabling net zero transport

gsma.com/betterfuture/climate

The transport sector needs to reduce CO₂ emissions by **4.4 gigatonnes** by 2030 to be on a path to net zero by **2050**

The GSMA forecast mobile connectivity can enable **65%** of the required reduction

This breaks down to...

- **24%** Electrification
- **21%** Shipping
- **11%** Heavy Goods Vehicles
- **9%** Working from Home

**2.8 gigatonnes** of CO₂ by 2030

**2.8 billion flights** from New York to Paris

Potential emissions savings in these four areas equals*

CO₂ avoidance from the use of connected transport is equivalent to*

Regional splits of CO₂ emission reductions, enabled by mobile connectivity, 2020-30

**Electric Vehicles**

- Changing stations and enabling electric vehicles while on board

**Working from home**

- Changes in work patterns leading to less commuting journeys (especially by car), which averages 1.6-1.9km each way

**Shipping and Ports**

- Fuel savings on shipping journeys, enabled by IoT telematics which optimise routing and port arrival times

**Trucks/Logistics**

- CO₂ reductions from fuel savings in trucks connected with IoT telematics which optimise routing and arrival times at consignment points

How does it all work:
Mobile enabling net zero buildings

gsma.com/betterfuture/climate

The buildings sector needs to reduce CO₂ emissions by 5.1 gigatonnes by 2030 to be on a path to net zero by 2050.

The GSMA forecast mobile connectivity can enable 43% of the required reduction.

This breaks down to 6% for smart buildings - commercial electricity, 9% for smart buildings - commercial gas, 12% for HVAC*, and 16% for smart meter - residential electricity.

which equals 2.2 gigatonnes of CO₂ savings

This is equal to heating 90 million homes over the same period.

Regional splits of CO₂ emission reductions, enabled by mobile connectivity, 2020-30

- North America: 60% reduction
- Latin America: 50% reduction
- Europe: 40% reduction
- MENA: 30% reduction
- SSA: 20% reduction
- Asia Pacific: 10% reduction

How does it all work:

**Residential Smart Meters**
- Smart electricity meters track energy usage in real time, which households can monitor. The energy savings relative to households without a connected meter is approx. 3% per year.

**Commercial Smart Meters (Electricity)**
- These systems monitor and regulate temperatures in larger buildings and some transport settings. They can draw on AI to run analytics and modify temperature in real-time, and reuse cool external air without drawing electricity.

**HVAC**
- HVAC systems are crucial for energy efficiency in buildings. They can reduce CO₂ emissions by adjusting temperature, ventilation, and humidity levels.
Methodologies
## Mobile Sector

### Climate targets by operator

<table>
<thead>
<tr>
<th>MOBILE NETWORK OPERATOR</th>
<th>SCIENCE-BASED TARGETS</th>
<th>CARBON NEUTRAL TARGET YEAR</th>
<th>NET ZERO TARGET YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 Telekom</td>
<td>1.5°C</td>
<td>2014</td>
<td></td>
</tr>
<tr>
<td>America Movil</td>
<td>1.5°C</td>
<td></td>
<td>2050</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>2°C</td>
<td>2035</td>
<td></td>
</tr>
<tr>
<td>Airtel (Bharti)</td>
<td>Committed Aug 2019</td>
<td></td>
<td>2050</td>
</tr>
<tr>
<td>Bell (Canada)</td>
<td></td>
<td>2025</td>
<td></td>
</tr>
<tr>
<td>BT (EE)</td>
<td>1.5°C</td>
<td></td>
<td>2045</td>
</tr>
<tr>
<td>Deutsche Telekom</td>
<td>1.5°C</td>
<td>2025</td>
<td>2040</td>
</tr>
<tr>
<td>Elisa</td>
<td>1.5°C</td>
<td></td>
<td>2020</td>
</tr>
<tr>
<td>Far EastTone</td>
<td>2°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iliad Group</td>
<td></td>
<td>2035</td>
<td></td>
</tr>
<tr>
<td>JT Global</td>
<td></td>
<td>2030</td>
<td></td>
</tr>
<tr>
<td>KPN</td>
<td>1.5°C</td>
<td>2015</td>
<td>2040</td>
</tr>
<tr>
<td>Liberty Global</td>
<td>1.5°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LG Uplus</td>
<td></td>
<td>2030</td>
<td></td>
</tr>
<tr>
<td>Magyar Telekom</td>
<td>1.5°C (pending)</td>
<td>2016</td>
<td>2050</td>
</tr>
<tr>
<td>MTN Group</td>
<td>1.5°C (pending)</td>
<td>2040 (pending)</td>
<td></td>
</tr>
<tr>
<td>NTT DOCOMO</td>
<td>&lt;2°C</td>
<td></td>
<td>2040</td>
</tr>
<tr>
<td>Orange</td>
<td>Committed May 2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proximus</td>
<td>&lt;2°C</td>
<td>2016</td>
<td>2050</td>
</tr>
<tr>
<td>Reliance Jio</td>
<td>Committed Aug 2019</td>
<td></td>
<td>2050</td>
</tr>
<tr>
<td>Safaricom</td>
<td>&lt;2°C</td>
<td>2050</td>
<td>2050</td>
</tr>
<tr>
<td>STC</td>
<td>Committed Mar 2020</td>
<td></td>
<td>2050</td>
</tr>
<tr>
<td>Singtel</td>
<td>&lt;2°C</td>
<td></td>
<td>2050</td>
</tr>
<tr>
<td>SK Telecom</td>
<td>Committed Feb 2020</td>
<td></td>
<td>2050</td>
</tr>
<tr>
<td>Swisscom</td>
<td>1.5°C</td>
<td>2020</td>
<td>2050</td>
</tr>
<tr>
<td>Taiwan Mobile</td>
<td>2°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TDC</td>
<td>Committed Jul 2019</td>
<td>2028</td>
<td>2050</td>
</tr>
<tr>
<td>Tele2</td>
<td>Committed Jan 2020</td>
<td>2020</td>
<td></td>
</tr>
<tr>
<td>Telefónica</td>
<td>1.5°C</td>
<td></td>
<td>2030*</td>
</tr>
<tr>
<td>Telenor Group</td>
<td>Committed Feb 2020</td>
<td>2030**</td>
<td></td>
</tr>
<tr>
<td>Telia</td>
<td>1.5°C</td>
<td>2020</td>
<td>2030</td>
</tr>
<tr>
<td>Telstra</td>
<td>Committed Feb 2020</td>
<td>2020</td>
<td>2050</td>
</tr>
<tr>
<td>Telus</td>
<td>Committed Jan 2021</td>
<td>2030</td>
<td>2050</td>
</tr>
<tr>
<td>Verizon</td>
<td>Committed Aug 2019</td>
<td>2035</td>
<td>2040</td>
</tr>
<tr>
<td>Vodafone</td>
<td>1.5°C</td>
<td>2030</td>
<td>2040</td>
</tr>
</tbody>
</table>

* In its four main markets*

** Nordic operations

Science-based targets - see https://sciencebasedtargets.org/companies-taking-action/
Carbon neutral refers to reducing and offsetting carbon emissions from own operations (all Scope 1 and 2 emissions)
Net zero refers to the criteria used by the UN Race To Zero campaign: https://unfccc.int/climate-action/race-to-zero-campaign
Energy Sector

Methodology and approach

Two primary use cases for digital tech interventions in the power and energy sector were analysed, both of which are underpinned by IoT sensors and connectivity.

- **Connected solar grids.** Connected power grids to manage and distribute solar energy. Grids are equipped with IoT sensors that, in turn, connect to a mobile network, cloud and/or end user premises (residential or commercial) through cellular or non-cellular protocols.

- **Connected wind grids.** Connected power grids to manage and distribute wind energy. Grids are equipped with IoT sensors that, in turn, connect to a mobile network, cloud and/or end user premises (residential or commercial) through cellular or non-cellular protocols.

There was a three step process:

1. Forecasts were used from Exponential Roadmap¹ to determine the aggregate amount of CO₂ savings a given industry will need to make over the next 10 years to ensure it remains on track for net zero by 2050. For all sectors, this reduction is equivalent to 50% of 2020 CO₂ emissions.

2. For both use cases – connected solar and wind grids – estimations were made for the share of the renewable energy grids that are IoT connected at present and over the next 30 years to 2050, drawing on our proprietary IoT forecasts and publicly available research. This translates into an overall level of avoided CO₂ emissions through the substitution with fossil fuels that would otherwise emit carbon into the atmosphere.

3. The use case savings over a 10 year period are divided into the aggregate sector reduction (from step 1) to arrive at a contribution share (e.g. connected solar grids can account for 33% of the emission reductions required in the power sector over the next 10 years).

## Key assumptions

<table>
<thead>
<tr>
<th>Use case</th>
<th>Indicator</th>
<th>Trajectory</th>
<th>Supporting data/sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connected grid - solar</td>
<td>PV capacity growth</td>
<td>Annual net increase in solar PV capacity in 2020 applied for remainder of forecast period to 2030 at regional level.</td>
<td>International Energy Agency (IEA)</td>
</tr>
<tr>
<td>Connected grid - solar</td>
<td>% of solar grid connected with IoT sensors</td>
<td>35% in 2020, rising to 75% in 2050 in straight line fashion.</td>
<td>IEA, GSMA Intelligence</td>
</tr>
<tr>
<td>Connected grid - solar</td>
<td>Electricity emission factors (EEFs)</td>
<td>2019 base year EEFs calculated at regional level. Forward projections to 2030 for each region based on growth rate of UK EEF forecasts from UK Department of Business, Energy and Industrial Strategy (BEIS).</td>
<td>Carbon footprint.com; IEA; UK BEIS</td>
</tr>
<tr>
<td>Connected grid - wind</td>
<td>Wind capacity growth</td>
<td>Wind capacity growth calculated by Global Wind Energy Council (GWEC) for 2019 and 2020. Assume annual growth of 4.5% from 2020-25 before reducing to 2% from 2025-50.</td>
<td>GWEC</td>
</tr>
<tr>
<td>Connected grid - wind</td>
<td>% of wind grid connected with IoT sensors</td>
<td>10% in 2020, rising to 75% in 2050 in straight line fashion.</td>
<td>GWEC, GSMA Intelligence</td>
</tr>
<tr>
<td>Connected grid - wind</td>
<td>Electricity emission factors (EEFs)</td>
<td>2019 base year EEFs calculated at regional level. Forward projections to 2030 for each region based on growth rate of UK EEF forecasts from UK Department of Business, Energy and Industrial Strategy (BEIS).</td>
<td>Carbon footprint.com; IEA; UK BEIS</td>
</tr>
</tbody>
</table>
Manufacturing sector

Methodology and approach

The manufacturing sector centres on the development of smart factories. There are several types of technologies within a smart factory that can improve productivity, lower energy consumption and reduce CO₂ emissions. Factories are fitted with connected technology and networks to improve overall productivity via automation. IoT sensors are typically fitted to machinery, which can be linked back to analytics suites to analyse very large streams of data in real time. This allows for production capacity to be shifted dynamically and faults to be repaired remotely.

There was a three step process:

Forecasts were used from Exponential Roadmap² to determine the aggregate amount of CO₂ savings a given industry will need to make over the next 10 years to ensure it remains on track for net zero by 2050. For all sectors, this reduction is equivalent to 50% of 2020 CO₂ emissions.

Assumptions were made for how much of manufacturing IoT connections are set in factories specifically. An average rate of energy savings per year is then applied to the number of smart factories and combined with the electricity emission factors to calculate a total CO₂ savings associated with smart factories in each region.

1. The use case savings over a 10 year period are divided into the aggregate sector reduction (from step 1) to arrive at a contribution share

## Key assumptions

<table>
<thead>
<tr>
<th>Vertical</th>
<th>Use case</th>
<th>Indicator</th>
<th>Trajectory</th>
<th>Supporting data/sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>Smart factories</td>
<td>Number of smart factories</td>
<td>Total factories in operation worldwide estimated at 9.6 million as of 2020. Using the average IoT density figures, an estimate of 130,000 smart factories were in operation as of 2020, or 1.4% of the global total.</td>
<td>WEF, China Statistical Yearbook</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>Smart factories</td>
<td>IoT proliferation</td>
<td>Assume approx. 420 million IoT connections in smart factories worldwide as of 2020, rising 40% per year to 2.1 billion by 2030.</td>
<td>GSMA Intelligence</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>Smart factories</td>
<td>Energy savings</td>
<td>Assume energy savings of 15% per year on average for smart factories.</td>
<td>Bosch, Nokia (Oulu factory)</td>
</tr>
</tbody>
</table>
Transport sector

Methodology and approach

Four use cases for transport-related technology were analysed that covers connected fleets (HGV and maritime), electric vehicles (EVs), and working from home – an indirect but nevertheless material carbon saving from the reduction in commuting journeys.

**There was a three step process:**

Forecasts were used from Exponential Roadmap\(^3\) to determine the aggregate amount of CO\(_2\) savings a given industry will need to make over the next 10 years to ensure it remains on track for net zero by 2050. For all sectors, this reduction is equivalent to 50% of 2020 CO\(_2\) emissions.

In each of the fleet management categories – HGVs and commercial shipping – assumptions were made on the level of telematics penetration and resulting fuel savings before extrapolating to a regional level. For EVs, a figure was estimated for current EV charging points, forecasted forward, and then fuel savings and associated CO\(_2\) reductions were calculated based on the reduction in journeys using petrol and diesel cars. Working from home (WFH) uses estimates for the average WFH days per year per eligible worker, alongside GSMA forecasts for mobile and fixed line internet access in households as a pre-requisite for productive remote working.

1. The use case savings over a 10 year period are divided into the aggregate sector reduction (from step 1) to arrive at a contribution share.

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## Key assumptions

<table>
<thead>
<tr>
<th>Vertical</th>
<th>Use case</th>
<th>Indicator</th>
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<th>Supporting data/sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>EV’s</td>
<td>EV charging points</td>
<td>Assume that EV charge points represent 1% of smart city IoT connections in 2021, rising to 10% by 2030.</td>
<td>GSMA Intelligence, Machina</td>
</tr>
<tr>
<td>Transport</td>
<td>EV’s</td>
<td>Electricity consumption</td>
<td>A total of approx. 3,700 kWh is used per charge point per year.</td>
<td>Various</td>
</tr>
<tr>
<td>Transport</td>
<td>EV’s</td>
<td>Electricity emission factors (EEFs)</td>
<td>2019 base year EEFs calculated at regional level. Forward projections to 2030 for each region based on growth rate of UK EEF forecasts from UK Department of Business, Energy and Industrial Strategy (BEIS).</td>
<td>IEA; UK BEIS; carbonfootprint.com</td>
</tr>
<tr>
<td>Transport</td>
<td>Smart routing and fleet management (HGVs)</td>
<td>HGVs in operation</td>
<td>Of the approx. 360 million commercial vehicles in use, we assume that 60 million (17%) are HGVs. Of these, we assume 50% are fitted with IoT telematics sensors, equating to 30 million connected HGVs.</td>
<td>GSMA Intelligence, Statista</td>
</tr>
<tr>
<td>Transport</td>
<td>Smart routing and fleet management (HGVs)</td>
<td>Fuel savings</td>
<td>Assume an average 5% fuel savings for connected HGVs based on range of studies reporting figures 5-20%.</td>
<td>Various</td>
</tr>
<tr>
<td>Transport</td>
<td>Smart routing and fleet management (maritime)</td>
<td>Shipping emissions</td>
<td>An average of 17,700 kg CO$_2$ per ship per year is derived from estimates for total ships in operation and associated aggregate fuel consumption using data from the IMO.</td>
<td>International Maritime Organisation</td>
</tr>
<tr>
<td>Transport</td>
<td>Smart routing and fleet management (maritime)</td>
<td>Fuel savings</td>
<td>Assume an average 2% fuel savings for commercial ships fitted with IoT telematics sensors.</td>
<td>Carbon Trust</td>
</tr>
<tr>
<td>Transport</td>
<td>Working from home (WFH)</td>
<td>Workforce enabled to work from home (WFH)</td>
<td>Annual FTE days WFH estimated based on propensity for certain occupations to WFH, with a downward adjustment to be conservative.</td>
<td>McKinsey</td>
</tr>
<tr>
<td>Transport</td>
<td>Working from home (WFH)</td>
<td>Employed population</td>
<td>Assume 70% of the working age population in each region is employed.</td>
<td>World Bank</td>
</tr>
<tr>
<td>Transport</td>
<td>Working from home (WFH)</td>
<td>Internet connectivity</td>
<td>LTE and forecast 5G mobile subscribers taken as proxy for having internet access of a sufficient quality to permit WFH.</td>
<td>GSMA Intelligence</td>
</tr>
</tbody>
</table>
Buildings sector

Methodology and approach

The buildings sector is split between residential and commercial segments. Four use cases were profiled for technology in support of lowering emissions covering smart electricity meters for households, smart electricity and smart gas meters in offices and industrial premises, and Heating Ventilation and Air Conditioning (HVAC) systems.

There was a three step process:

1. For each use case, residential and commercial adoption (e.g. the proliferation of a smart gas meter in office buildings) is based on GSMA Intelligence forecasts for IoT connections in the utility and buildings sectors with some adjustments. Then an average energy saving is assumed for homes and commercial premises with a given connected technology compared to those without. Combined with the electricity emission factor, this then yields an abatement factor for each technology that is extrapolated to scale by multiplying with the adoption forecasts.

2. The use case savings over a ten year period are divided into the aggregate sector reduction (from step 1) to arrive at a contribution share.

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### Key assumptions

<table>
<thead>
<tr>
<th>Use case</th>
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<th>Trajectory</th>
<th>Supporting data/sources</th>
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</thead>
<tbody>
<tr>
<td>Smart meter - residential (electricity)</td>
<td>Smart electricity meters</td>
<td>Assume 80% of smart meter connections are residential. This figure is applied to GSMA Intelligence IoT forecasts for smart meters.</td>
<td>GSMA Intelligence</td>
</tr>
<tr>
<td>Smart meter - residential (electricity)</td>
<td>Energy savings for smart meter households</td>
<td>Assume average household with smart meter uses 3% less energy per year than those without the technology. This savings is applied to each region. Various studies have estimated energy savings to range between 3-15% for smart meter households. We assume a figure of 3% to be conservative.</td>
<td>Various</td>
</tr>
<tr>
<td>Smart buildings - commercial (electricity)</td>
<td>Energy savings</td>
<td>Assume electricity savings of approx. 10-15% in buildings fitted with smart electricity meters based on range of studies.</td>
<td>Various</td>
</tr>
<tr>
<td>Smart buildings - commercial (gas)</td>
<td>Energy savings</td>
<td>Assume gas savings of approx. 20-25% in buildings fitted with smart gas meters based on range of studies.</td>
<td>Various</td>
</tr>
<tr>
<td>HVAC</td>
<td>Energy savings</td>
<td>Assume energy savings of approx. 15% in buildings and other enterprise settings fitted with HVAC units. This is at the low end of studies which range from 15-30% savings.</td>
<td>Various</td>
</tr>
</tbody>
</table>