ESG Industry Report Card: Telecoms

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(***Editor's Note:*** *Our ESG Industry Report Cards include an analysis of ESG factors for a selection of companies. We intend to expand our ESG Industry Report cards to include more companies throughout the year.)*

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Key Takeaways

- The telecom sector's exposure to security risks and megatrends like demographic changes, social media, and increased connectivity means that, of the environmental, social, and governance (ESG) risk factors, social risk is the most meaningful.
- Governance risk can also be a significant factor for the rating, particularly when operating in emerging markets.
- Although the sector has limited exposure to environmental risk, we have seen some green bond issuance and other initiatives from the sector, indicating the importance and measurability of increasing energy efficiency.

In S&P Global Ratings' view, the most meaningful rating risks for the telecommunication industry relates to social exposures stemming from consumer behavior, social cohesion and safety management risks. Environmental exposures are lower due to the industry's low direct and indirect use of water and relatively low contribution to greenhouse gas emissions, waste, pollution, and toxicity. Governance-related factors are more company- and region-specific, and primarily relate to jurisdictional uncertainties in emerging markets.

Generally the sector's exposure to social and environmental risks has only a modest impact on our credit analysis. Of the two, social risks are more prominent in our analysis, but the sector is increasing its focus and reporting on environmental risks, which are more quantifiable than other ESG risks. The individual risk factors, associated time scales, and mitigating factors vary by company.

The ESG Risk Atlas

To calibrate the relative ranking of sectors, we use our environmental, social, and governance (ESG) Risk Atlas (see "The ESG Risk Atlas: Sector And Regional Rationales And Scores," published May 13, 2019). The Risk Atlas provides a relative ranking of industries in terms of exposure to environmental and social risks (and opportunities). The sector risk atlas charts (shown below) combine each sector's exposure to environmental and social risks, scoring it on a scale of 1 to 6. A score closer to 1 represents a relatively low exposure, while 6 indicates a high sectorwide exposure to environmental and social risk factors (for details see the Appendix). This report card expands further on the Risk Atlas sector analysis by focusing on the credit-specific impacts, which in turn forms the basis for analyzing the exposures and opportunities of individual companies in the sector.

Social Exposure (Risk Atlas: 4)

Demographic shifts and megatrends like social media and connectivity are key social exposures that affect consumer demand for telecoms. Currently, these factors are shifting demand toward wireless, rather than landline services that offer better utility and personalization, and toward broadband-based over-the-top TV services, rather than traditional cable and satellite video offerings.

Such shifts can test a company's ability to allocate capital and affect return on capital, given the sector's long-lived assets. The ongoing debates over the societal impact of excessive use of social media, particularly among younger users, and the effect of misinformation in the media could create social pressure to reduce or change usage patterns.

Any incidents related to data security and systems stability in the telecoms sector will also be highly visible, given the sector's extensive reach. Thus, security concerns over an equipment supplier, for example, could trigger a shift in public perception, or an outright regulatory ban. Such a ban would weigh on pricing and could cause delays to network projects. Loss of access to a supplier's technology could also affect service quality and may require the costly and disruptive replacement of equipment. If a company suffers an actual network security breach, it can have even more dire reputational and regulatory consequences.

In assessing social risk, we consider public confidence in operators on community engagement, equity, and corporate citizenship. Given the sector's large and ethnically diverse customer base, community relationships and sensitivity form low, but important social cohesion risks.

Telecom companies also typically have large workforces that are significantly unionized. This makes human capital management another key social risk. The industry's technicians are associated with safety management risks, as are the personnel that build and maintain the telecom infrastructure, including towers and data centers. Another nascent, but notable, social risk stems from potential health concerns regarding exposure to electromagnetic frequency (EMF) radiation from high-frequency fifth-generation (5G) telecom equipment and devices. This could affect consumer perception and usage of telecom services.

Environmental Exposure (Risk Atlas: 2)

The telecom sector's use of energy to power its communication networks, data centers, and operations (such as truck rolls, IT systems, call centers, points of distribution, and IT systems) is less intensive than utilities or natural resource sectors. It therefore makes a relatively moderate contribution to greenhouse gas emissions.

That said, the sector has turned its attention to increasing its energy efficiency and we have begun to see telecoms companies like Telefonica and Verizon issuing green bonds. Fiber to the home (FTTH) is 85% more energy-efficient than copper networks because it reduces the need for cooling systems and the number of central offices. We expect to see companies deploying FTTH more widely, which will help to achieve energy reduction targets.

Exposure to climate change risks is modest and largely based on the effect extreme weather such as hurricanes, tornadoes, ice storms or flooding would have on telecoms operating infrastructure and customers. We classify the perceived health risks of EMF radiation as a social exposure, pending further studies. Should health risks turn out to be justified, we could also consider the radiation exposure as an environmental risk in our ratings, similar to other forms of pollution.

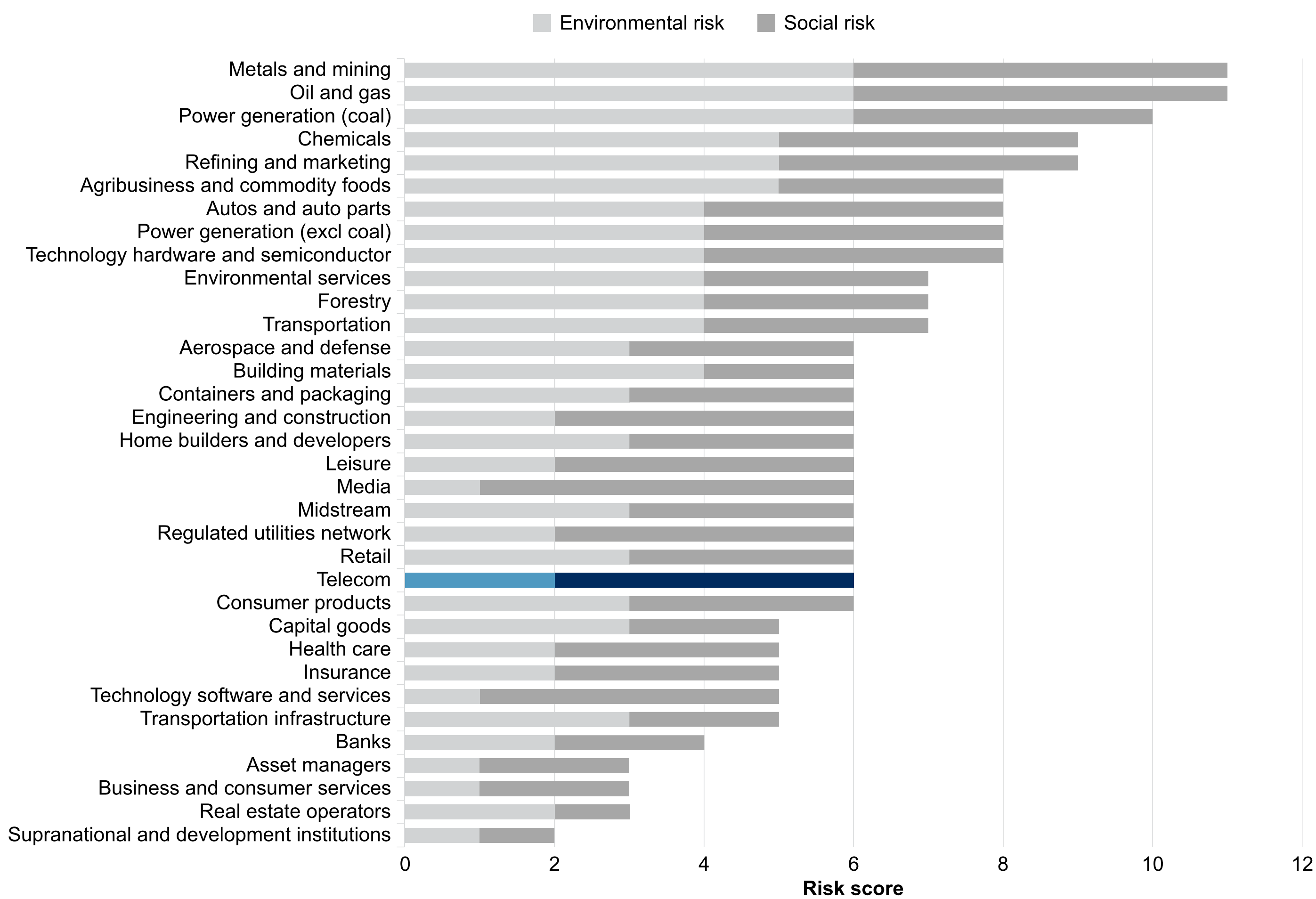
Governance Exposure

Governance-related factors are typically more company- and region-specific. Most are related to jurisdictional uncertainties in emerging markets. This can lead to regulatory and litigation risk. In addition, operational frameworks--for example, those used to run spectrum auctions--may be unpredictable, resulting in unexpected outcomes, or delayed decisions.

In some instances, government regulation can itself affect operations--for example, restrictions on the use of VOIP services can have clear implications for data usage and, ultimately, revenue potential.

In some countries, the government views telecom operators as proving a service, more like a public utility. Operators may be subject to service obligations that affect capital expenditure and return on capital. For example, they may have an obligation to build a physical network in rural areas.

ESG Sector Risk Atlas



Source: S&P Global Ratings.

Environmental, Social, And Governance Risks In Telecoms

Table 1

Company/Rating/Comments	Country	Analyst
America Movil S.A.B. de C.V. (A-/Negative) Although ESG risks do not represent a material driver for our rating on America Movil, we consider cybersecurity to be one of the most relevant social risks. The number of cyberattacks in Latin America has been increasing by more than 10% a year because the region's technical capabilities and law enforcement's ability to deter cybercrime lag behind those of developed markets. Although America Movil has not reported any incidents related to cybersecurity, we consider a system breach or data loss could trigger costly legal proceedings and reputational, as well as financial, damage. America Movil's strong corporate governance supports its operational effectiveness. The company has a long track record of flexibility and adaptability to changing business conditions, particularly regulatory changes in Latin America. These have reduced margins in previous years. The company's ability to recover profitability after such events gives us comfort that the company will have the financial and managerial capacity to cope with new regulations, if needed. America Movil has prudent policies to manage environmental risks. The company' practices address the use of clean energy, waste disposal, and control of gas emissions, and also create cost savings in some of its core markets, such as Mexico. America Movil operates in markets exposed to adverse weather conditions and natural disasters, but we consider it is well equipped to contain interruption risks. In 2017, the company was able to restore operations within days of a hurricane in Puerto Rico that reduced network availability. It also temporarily opened up wireless and fixed-line services to support communities affected by the 2017 earthquake in Mexico. Its network was not damaged by the earthquake.	**Mexico**	**Luis Martinez**
American Tower Corp. (BBB-/Stable) AMT's exposure to regulatory, social, and environmental risks is immaterial to the current rating. AMT operates in developing markets, where it generates about 40% of its consolidated revenue. This exposes the company to less certain legal and regulatory conditions. In South Africa for example, ownership restrictions were imposed in 2003; this led AMT to establish joint ventures for its South African operations. Social risks also stem from AMT's geographic diversity, including its exposure to a wide range of norms for business and community engagement. AMT attempts to addresses this by working with local municipalities and community members during its development and leasing process and through its philanthropic work. AMT's exposure to environmental risk stems from the energy usage associated with its tower site operations around the world and with its vehicle fleets in the U.S. The risk is most acute in developing markets such as India and Africa where AMT's tower sites are typically powered by diesel generators. These have worse environmental effects than those powered by an electric grid. AMT is deploying renewable energy solutions in these markets to reduce its reliance on fossil fuels, including increasing its use of renewable energy and hybrid battery storage. The company's goal is to reduce its fossil fuel consumption at off-grid tower sites by 60% by 2028.	**U.S.**	**Ryan Gilmore**
AT&T Inc. (BBB/Stable) AT&T's 2018 acquisition of Warner Media, which now accounts for about 20% of total revenue, increased its exposure to the social risks associated with the media sector, such as data security, content regulation, and social media activism. AT&T's advertising business, Xandr, aims to expand its targeted advertising by collecting consumer data that is supposed to be kept confidential. Any theft of either consumer data or intellectual property (IP) could materially harm AT&T's reputation, potentially eroding its revenue and margins. Demand for traditional services such as pay-TV, traditional voice, and DSL services is falling because of changing usage patterns, especially among younger users. Despite AT&T's efforts to grow its over-the-top (OTT) video platform (DTV Now), it has lost a substantial number of traditional satellite video subscribers. This social risk contributed to a sharp 8% decline in video revenue in 2018. AT&T has a very large workforce, of which over 40% is unionized. As a result, the company is subject to periodic work stoppages that can hurt business operations. Currently, about 10% of AT&T's workforce (about 26,000 employees) are on contracts that are due to expire in 2019. To date, work stoppages have not affected the ratings, although we view this as a moderate credit risk. Although AT&T is exposed to some environmental risks, such as greenhouse emission from its vehicle fleets and data center operations, the credit impact is low. Its goal is to reduce carbon emissions to 10th of the current level and it has introduced four new wind energy centers to help achieve this aim.	**U.S.**	**Allyn Arden**
Axiata Group Bhd. (BBB+/Stable) Axiata is exposed to regulatory risks, particularly in its emerging market operations. For example, Axiata operates in Nepal, through Ncell. It was given full clearance by the Large Taxpayers Office of Nepal (LPTO) after it paid capital gains tax in 2017, following its purchase of Ncell. However, the LTPO brought further claims in April 2019, which Axiata is contesting. Currently, we do not foresee any other specific and material regulatory risks. However, if Axiata increases its presence in emerging markets, we consider increased regulatory risks to be inevitable. Axiata has undertaken initiatives to increase energy efficiency and reduce carbon emission by constructing bamboo telecommunication towers in Bangladesh and installing green energy sites. edotco--a towers company owned by Axiata--is deploying more bamboo towers in Bangladesh and is also looking to bring bamboo towers to its other markets. Axiata's installation of green energy sites involves converting existing	**Malaysia**	**Yijing Ng**

sites to use alternative sources of energy for power, instead of diesel.

BCE Inc. (BBB+/Stable)	**Canada**	**Aniki Saha-Yannopoulos**
BCE's social and environmental exposures are similar to those of peers. Although environmental exposure is not a material ratings driver, the company is addressing the issue through its greenhouse gas (GHG) emission and e-waste management programs. BCE plans to reduce the amount of carbon dioxide equivalent it emits to 75% of its 2014 levels by the end of 2020; currently, it has reached 65% of its target and is actively pursuing electric transport solutions. BCE runs several programs to minimize landfill waste--in 2017, the company diverted almost 64% of company-generated waste from landfill. It also plans to recover 10 million used TV receivers, modems, and mobile phones between 2016 and 2020, and is currently at 48% of its target.		
BT Group PLC (BBB/Stable)	**U.K.**	**Osnat Jaeger**
Following the discovery of improper practices in the Italian business in 2017, we revised our assessment of BT's management and governance to fair. The issue was not sufficient to affect the rating but did weigh on EBITDA, cash flow, and the valuation of BT's Italian business; EBITDA fell by about £170 million and cash flow by £450 million. In our view, there is still a risk that the Italian authorities could pursue litigation related to these events. However, the weak oversight was restricted to the Global Services division (and not the core U.K. operations) and BT has since refreshed its processes and controls across the group. BT has demonstrated its commitment to reducing its exposure to social risks stemming from privacy and security concerns. These not only encompass reputational risks but also risks raised by the U.K. intelligence services. For example, the company has a long-term policy not to use Huawei equipment in its fixed core and has an ongoing program to remove Huawei equipment from the core network of its mobile unit EE. It also excluded Huawei from bidding for contracts to supply equipment for use in its core 5G network. Younger users' changing usage patterns have a greater impact on legacy providers like BT, especially because coverage of FTTH is lower in the U.K. than at other European peers. BT is under considerable pressure from both users and its regulator Ofcom to increase its investment in FTTH. This weakens its cash flow profile and somewhat constrains the rating. Environmental risks are not material to the rating. In 2016, BT met its 2008 target to reduce operational emissions by 80% four years early. In 2017, it announced a plan to cut carbon emissions intensity by a further 87% by 2030, and to cut carbon emissions to zero by 2045.		
Comcast Corp. (A-/Negative)	**U.S.**	**Naveen Sarma**
Comcast is exposed to social risks that include data security, certain government regulations, and social media activism. It produces film and television content through its NBCUniversal business segment, exposing it to certain risks if any of its content is considered offensive or controversial. Federal regulators--specifically, the FCC--could impose monetary fines and, in extreme cases, could pull broadcast licenses for NBC's TV stations. Comcast's cable and NBCUniversal businesses give it access to confidential consumer data. If either consumer data or IP is stolen, it could materially harm Comcast's reputation, and could lead to legal or regulatory actions. Like many of its peers, Comcast has two classes of stock. The class B super voting stock, which is solely owned by chairman and CEO Brian Roberts, gives Mr. Roberts 33% voting control, despite having an economic interest of less than 1%. We do not view this structure as detrimental to corporate governance. For one, Mr. Roberts does not control the company. And more importantly, we have not seen any evidence of actions that would place Mr. Roberts' interests above those of the other shareholders.		
Deutsche Telekom AG (BBB+/Watch Neg)	**Germany**	**Lukas Paul**
In 2017 and the first quarter of 2018, the destruction caused by hurricanes in Texas, Florida, and Puerto Rico caused Deutsche Telekom's subsidiary T-Mobile U.S. to lose about $240 million in EBITDA. Although ongoing climate change could magnify the risk of similar events, at this stage it does not affect our rating. Such events have had limited effect on TMUS, and insurance contracts will eventually allow it to recover most of the total damage. The group's energy consumption is the main other environmental consideration for DT. Although energy costs still represent a relatively small share of DT's overall cost base, energy efficiency and reduced greenhouse gas emissions are key performance indicators and form an integral part of its strategy. DT has been slower to roll-out energy-efficient FTTH networks than some of its peers. However, in 2018, 52% of the group's energy consumption was from renewable sources, and DT aims to raise that to 100% by 2021. Moreover, the group intends to cut its carbon dioxide emissions by 90% by 2030, compared with 2017. We think DT's ongoing migration to all-IP networks and its plans to scale up FTTH deployment over 2019–2021 will help to contain potential upward pressure on energy costs. As a result, we do not expect them to present a material risk to our forecast. Sensitivity to data privacy and security issues is especially high in DT's home market in Germany. More than 90% of survey respondents consider protection of personal data to be relatively or very important. DT must therefore comply with the highest standards on data protection, security, and the prevention of cyberattacks, which carries an incremental cost. Germany also has strong trade unions, which can lead to cost inflation. About 52% of the group's employees are covered by collective bargaining agreements. In 2018, DT raised pay by about 5% for about 55,000 employees in Germany and gave them about two weeks more vacation time, reducing average weekly working hours. To achieve its targets for EBITDA growth in Germany, DT needs to offset the associated upward pressure on operating expense through other cost efficiencies.		
Equinix Inc. (BBB-/Stable)	**U.S.**	**Chris Mooney**
Data centers require a vast, and rapidly increasing, amount of power. Rising energy costs, carbon emissions, water scarcity, and potential regulation are longer-term risks, but do not currently have a material effect on ratings. Equinix has made substantial progress in achieving its long-term pledge to power its facilities with 100% clean and renewable energy--90% of		

its global electricity consumption in 2018 came from renewable energy, up from 77% in 2017. Although this may not result in near-term economic savings, we consider it socially responsible and prudent risk management, particularly considering the long-term potential for water scarcity in certain markets. Renewable energy sources have a much smaller carbon footprint and consume a fraction of the water used by fossil fuels such as coal.

Emirates Telecommunications Group Company PJSC (AA-/Stable)	**United Arab Emirates**	**Rawan Oueidat**

Social and governance factors are relevant to our analysis, but do not currently have a material effect on the rating. We view regulatory risks in the international markets (where about 40% of consolidated revenue and EBITDA is generated) as key to our analysis of Etisalat's ESG risks. For example, the legal and regulatory framework in the Indian telecoms sector can be opaque. Etisalat and several other foreign firms decided to exit their Indian operations in 2012; Etisalat's license had been revoked. Etisalat chose to exit the Nigerian market in 2017 after defaulting on a US$1.2 billion loan because of the weakening Nigerian currency. It had also proved difficult to ramp up operations and maintain market share in Nigeria's highly competitive telecoms market. In our view, Etisalat's acquisition of Maroc Telecom should help it to mitigate further regulatory risks in international markets, by centralizing its oversight of its African portfolio and exploiting Maroc Telecom's expertise and operational experience in the continent. As in most Gulf Cooperation Council (GCC) countries, voice over IP (VoIP) services such as Skype are blocked by the United Arab Emirates (UAE) government, Etisalat's majority owner, unless offered by the licensed operators. We do not expect the UAE to liberalize such policies, but could reassess if we see demand for a change. That said, despite the benign competitive landscape in the UAE market, supported by the operators' ownership structure, Etisalat continues to invest in its network, in line with government initiatives to become a Smart City, and the race to launch 5G. Etisalat's environmental risk does not currently affect the rating, despite exposure to higher temperatures in the Gulf states. Although an increase in extreme weather could trigger higher energy demand for operating its network, energy costs in the GCC are heavily subsidized, and total network costs contribution only 10% of consolidated operational expenditure.

KT Corp. (A-/Stable)	**South Korea**	**Junhong Park**

Although we factor social risks into our rating on KT Corp., they have a limited financial impact and thus do not materially affect our analysis. The South Korean government is strongly committed to developing 5G technology, and all local telecom operators, including KT have responded. KT is therefore one of the world's first 5G commercial service providers. Although the number of subscribers is expected to grow, particularly among younger users, we do not expect 5G to be monetized in the near term. Although changing customer usage patterns are eroding demand for traditional services like fixed-line telephony, the growth of KT's pay-TV (IPTV) business somewhat mitigates this issue. KT is managing its privacy and data protection risk factors by building security control capabilities. A fire in late 2018 disrupted KT's network for a day in parts of the Seoul area and inconvenienced some of its telecom customers. Although we do not expect KT to suffer any material legal penalties owing to this incident, the company waived one month's bill for affected subscribers and plans to compensate some small merchants for their business losses. This act of social responsibility somewhat reduced operating profitability, but the small scale limited the rating impact. KT recently announced that it will strengthen network safety management measures, mainly by securing emergency backup networks and stable power provision.

MTN Group Ltd. (BB+/Negative)	**South Africa**	**Omega Collocott**

MTN Group has found it challenging to maintain good regulatory relationships amid the volatile legal frameworks in the developing economies in which it operates. This introduces operating and financial uncertainties and litigation risk, particularly in Nigeria, which contributes around one-third of group EBITDA. MTN addresses these risks by investing in its regulatory relationships, localizing ownership where appropriate, building on the group's expertise in developing markets, and increasing oversight capacity at local and head office levels. However, governance factors remain a key rating driver. MTN's credit metrics took a hit in 2015, when its Nigerian operations were fined $5.2 billion by the regulator for late deactivation of unregistered SIM cards. This was later reduced to $1.6 billion. In 2018, the Nigerian authorities alleged that MTN Nigeria had improperly repatriated $8.1 billion in dividends, and owed $2 billion in taxes. A settlement in December 2018 reduced EBITDA margins by 1.6%, but the tax matter remains unresolved. Regulatory relationships in South Africa are stable, but mobile and data price reduction policies, plus data protection and SIM registration requirements, put pressure on revenue and margin forecasts in our base case. Spectrum constraints, and delays in new spectrum allocation, are also driving up capex. Governance and social considerations intersect when mobile telephony plays a key utility role. Many markets in which MTN operates have limited fixed-line telephony, making access to affordable mobile services more important. In such cases, MTN may feel societal and regulatory pressures to price voice and data services affordably, and provide networks in uneconomical, rural areas. MTN continues to invest in its networks, in line with regulatory and commercial initiatives. It has also developed programs to improve communications and internet access for lower-income segments and customers based in rural areas, through affordable coverage, data-enabled handsets and data, as well as service bundling and education.

Nippon Telegraph & Telephone Corp. (NTT Corp.) (AA-/Stable)	**Japan**	**Hiroyuki Nishikawa**

Social risk factors are more meaningful to our credit analysis of NTT than environmental and governance risk factors. NTT faces a unique demographic demand mix from young and old consumers, both with high connectivity and technology adoption rates, but with differing application needs, data consumption patterns, and marketing sensitivity. This divergence can lead to increased social exposures. For example, we downgraded the company in 2015, after it delayed the introduction of the latest iPhone and lost significant market share. The company has since recovered and its initiatives for 5G and the Internet of Things (IoT) are comparable with those of its competitors. Combined with countrywide, high-quality long-term evolution (LTE) network coverage and various content and settlement service offerings, these initiatives should enable NTT to maintain its leading share in mobile (around 43%). NTT's energy consumption and utility costs are not material to our rating. Its energy-efficient FTTH network covers over 90% of Japan, has partly mitigated increasing pressure on energy costs.

Oi S.A. (B/Stable)	**Brazil**	**Flavia Bedran**

In our view, poor governance was one of the major factors behind Oi S.A.'s 2016 default. The company made sizable dividend payouts and acquisitions that were inconsistent with its business performance and cash flow generation. Its capital structure became unsustainable. In our opinion, governance improved significantly because of the judicial reorganization plan implemented in 2018 and the new corporate structure. Oi has better defined business strategies, specific limits in remuneration payouts, and covenant restrictions on leverage. These tend to maintain debt at the level defined in the judicial plan. Therefore, we no longer regard governance as a major risk factor, but will monitor adherence to the targets. Changing consumer preferences are also crucial to Oi. For example, Oi has invested more heavily in broadband to meet the higher consumption of data, amid declining demand for fixed telephony, especially after years of subdued investments during its default. These higher investments will erode free cash flow generation in the next two years, but are necessary to improve service quality and so regain premium clients.

Ooredoo Q.P.S.C. (A-/Stable)	**Qatar**	**Rawan Ouiedat**

The diplomatic spat between Qatar and other GCC countries, which has been ongoing since June 2017, has slightly deflated roaming revenues, but had no material effect on ratings because roaming revenues were so small. The Qatari government, Ooredoo's majority owner, blocks VoIP services such as Skype. Such restrictions limit OTT competition, supporting high profitability margins of about 50% in Qatar. We do not expect Qatar to liberalize this policy, but could reassess if we see demand for a change. Ooredoo's exposure to higher temperatures in Gulf states does not affect our rating. Although an increase in extreme weather could increase the energy required to operate its network, energy costs in the GCC are heavily subsidized and contribute only 15% to operating expenditure.

Orange S.A. (BBB+/Stable)	**France**	**Mark Habib**

Of the ESG risks, reputational and security risks are the most relevant to our rating on Orange. Orange operates in many developing markets across Africa, where less predictable regulatory systems and higher expectations regarding operator responsibility to address access and inclusion needs lead to more reputational and community engagement risks. Orange works to actively mitigate this through stakeholder engagement and a focus on economic and social development programs. We view such initiatives positively as they provide a more robust framework in which to promote awareness of such needs and address them. Orange actively attempts to mitigate its environmental exposure by targeting a reduction in carbon dioxide emissions per customer to 50% of 2006 levels by 2020. We see its FTTH rollout efforts as supportive of such objectives, and second only to Telefonica in terms of coverage among Europe's five largest markets.

Telecom Italia SpA (BB+/Stable)	**Italy**	**Mark Habib**

TIM suffers from a lack of management continuity--it has had five CEOs in the past six years--and uncertainty over key strategic priorities, such as the sale of its network assets. We think the current divide at the board level, with Vivendi and Elliot Advisors sparring for control, could prolong the unpredictability. This limits our management and governance assessment to fair. Although we have seen some signs of a detente, until the company builds a track record of constructive partnership we will have little confidence in the long-term stability of board priorities. This, combined with its current financial risk profile, constrains the current rating at 'BB+'. The Italian market's weak fixed broadband infrastructure has heightened the importance of mobile data and made TIM more vulnerable to changing usage patterns from younger users. It has suffered from the entrance into the market of rival Iliad and its low-priced 30GB/month offer. We therefore forecast a 4% mobile revenue decline at TIM.

Telefonica S.A. (BBB/Stable)	**Spain**	**Paul Lukas**

Telefonica's recent €1 billion green bond issuance, one of the first in the telecom sector, underlines its commitment to renewable energy and energy efficiency. In Europe and Brazil, 100% of Telefonica's electricity comes from renewable sources, and the percentage is 58% across the whole group. The green bond issuance allowed Telefonica to diversify its investment base--about half of investors are identified as green investors. We view Telefonica's aggressive FTTH roll-out as positive to its ESG profile. It offers FTTH to two-thirds of households in Spain and FTTH's energy efficiency has allowed the company to stabilize its energy consumption, despite rapid traffic growth. Telefonica could face potential security concerns over equipment suppliers like Huawei, with whom Telefonica has reported it is partnering over a vast array of topics, from 5G and IoT to quantum cryptography for commercial networks. Depending on future political and regulatory developments, we could see losses stemming from public perception issues or increased costs from a loss of access to a supplier's technology.

Telstra Corp. Ltd. (A-/Stable)	**Australia**	**Ieva Erkule**

Social factors are relevant to our analysis, but, handled well, should not drive the rating. Telstra is one of Australia's largest employers and plans a large restructuring program that will cut about 8,000 roles over three years. This represents about a quarter of its total employees and will require Telstra to carefully navigate the complex industrial relationships in Australia. In addition, Telstra has certain obligations to serve the community. Telstra is responsible for delivering the Universal Service

Obligation (USO) and must ensure standard telephone services and payphones are reasonably accessible to all people in Australia on an equitable basis. This is both a legislative and contractual obligation. Telstra receives A$270 million per year--A$40 million for payphones and A$230 million for voice services (exclusive of goods and services tax)--of which it pays approximately half to provide USO services. Telstra's large and complex supply chain carries potential ESG risks and requires the company to monitor and manage labor practices and, environmental, health and safety, and bribery and corruption risks at its suppliers. During the year to June 30, 2018, Telstra engaged with more than 6,000 suppliers across over 45 countries. In our opinion, Telstra is well-positioned to address these risks and could convert some of these risks into long-term opportunities through innovative, technology-based solutions. We view Telstra's management and governance as prudent. The company has revised its operating strategy and corporate governance architecture. However, at its 2018 annual general meeting, Telstra saw sufficient shareholders vote against its executive pay to be considered a "first strike" against the board. Under a 2011 law, if it happens again in 2019, shareholders may replace the entire board.

Verizon Communications Inc. (BBB+/Positive)	**U.S.**	**Allyn Arden**

We view environmental risk as low although the company's recent $1 billion green bond issuance demonstrates its commitment to renewable energy in the form of solar and wind power and efficient energy through the development of "smart cities." Verizon's main source of environmental risk is greenhouse gas emissions from truck rolls and data center operations. Since 2009, Verizon has reduced its carbon intensity by about 54% and is targeting an additional 50% reduction by 2025. The financial impact on Verizon of the 2017 acquisition of Yahoo was minimal, because it was able to renegotiate the purchase price. However, the experience highlights the social risks stemming from privacy and security concerns. Before the acquisition was completed, Yahoo disclosed that it discovered two data breaches in 2013 and 2014. In addition, about 23% of Verizon's workforce is represented by labor unions. Periodic work stoppages have affected business operations, but have not affected ratings. As Verizon builds out its 5G fixed wireless network, which uses the high-frequency spectrum, it could see issues arising from public concern over electromagnetic radiation from telecom equipment. The company owns a large swath of mmWave spectrum through its acquisition of StraightPath. At present, this risk is not material to our rating analysis, but this could change if public or regulatory concerns increase. The U.S. government's ban on 5G telecom equipment produced by Huawei could reduce the social risk around potential security issues but it limits the vendor options, which could increase costs and create a competitive disadvantage relative to other global telecom providers that are allowed to use Huawei for 5G deployments.

Vodafone Group PLC (BBB+/Negative)	**U.K.**	**Osnat Jaeger**

Like its peers, changing usage patterns, especially from younger users, and reduced demand for traditional mobile voices services have forced Vodafone to change strategy. As a predominantly wireless player, Vodafone's exposure to the ever-growing demand for data is greater than its peers. It has been unable to offload to an on-net fixed network as effectively as converged peers. To maintain its competitive position, it has invested about €15 billion over the past five years in spectrum and upgrading its network to keep up with changing usage patterns. The relatively quick commoditization of data offers in various markets, especially Italy, has limited meaningful monetization of Vodafone's investments and we expect relatively flat revenue growth for Vodafone's mobile operations in Europe. Vodafone's key environmental risk exposure is through its significant electricity consumption in base stations and data centers. Its 310,000 base stations consume nearly two-thirds of its total energy consumption. Vodafone's 2025 targets include reducing its greenhouse gas emissions by 40% and purchasing 100% of its electricity from renewable sources. We reflect some of Vodafone's environmental exposure through our asset retirement debt adjustment of about €600 million, but this has no impact on the rating as it represents less than 0.1x of leverage.

Appendix: Components In The Sector ES Risk Atlas

Here is a list of examples of factors we consider in evaluating sector-specific environmental exposure. For example, we examine to what extent each sector is relatively exposed to:

Greenhouse gas emissions (GHG): Actual or potential regulations such as carbon taxes, emissions trading schemes, and other direct or indirect costs. The GHG emissions under the Kyoto climate change agreement are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Sensitivity to extreme weather events: Incremental costs or the potential physical impact on assets associated with recurring (for example, hurricanes) or infrequent (droughts) severe weather events.

Sensitivity to water scarcity: Potential costs related to the need for extracting or sourcing large quantities of water, or requiring on-site water treatment, in comparison to other water users of the same water basins or utilities.

Waste, pollution, and toxicity: Potential fines or rising costs associated with prevention and treatment of waste and pollution, including hazardous waste and air pollution.

Land use and biodiversity: Asset retirement obligations, developing natural land or potential operating constraints, or increased costs associated with protecting plant and animal life.

The following is a list of examples of factors we consider in evaluating sector-specific social exposure. For example, we analyze to what extent each sector is relatively exposed to:

Human capital management: A sector's capacity to develop a long-lasting productive workforce while reducing potential operational disruptions from workforce mismanagement; diversity and inclusion attributes; exposure to strikes and the sector's general exposure to dealing with emerging skills scarcity or surplus labor.

Changing consumer or user preferences: We recognize that changes in consumer behavior are often the result of complex dynamics, such as changes in technology or fashion or other disruptive business trends. Therefore, we treat a change in consumer preferences as a social factor related to sustainability, health, safety, the environment, privacy, financial mis-selling, or community and human rights, particularly when an entity has triggered the change.

Demographic changes: Potential costs or opportunities related to population growth and composition, such as an aging population, urbanization, changing living standards, or a growing middle class

Safety management: Potential direct or indirect costs resulting from problems related to the safety of a sector's production processes and final customer products.

Social cohesion: Potential or actual costs in direct operations or in the supply chain resulting from geopolitical or community-related events such as conflicts, community unrest, and terror attacks.

This report does not constitute a rating action.