

October 2020

ARE WE IGNORING THE ENVIRONMENTAL & SOCIAL IMPACT OF THE INTERNET?



PRI Principles for
Responsible
Investment
A+ ESG INTEGRATION

Alquity

LIFE CHANGING INVESTMENTS

SUMMARY

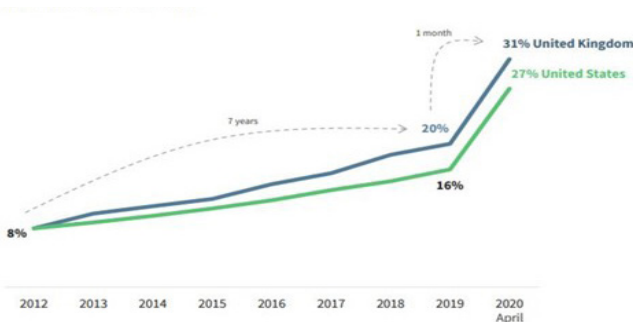
- Technology is a significant and rapidly growing part of both our daily lives and investors' portfolios, with existing trends only accelerated by the Covid pandemic.
- Internet companies can have a material impact on the environment and may have a significantly negative social impact. This is not widely appreciated or understood. For example, China's data centre industry alone consumed 161 TWh (terawatt-hours) of electricity in 2018 – that is the same electricity consumption as the whole of Thailand.
- At Alquity, we therefore consider ESG analysis of internet companies as importantly as other industries with more tangible output. We look to the US internet giants for examples of best practice for application to our Emerging Market companies.
- We share insights into our engagement strategy that we believe investors can use to help positively influence managements.

DO E&S FACTORS MATTER WHEN ASSESSING INTERNET COMPANIES?

We are spending more time online than ever before. Banking, shopping, communicating, entertainment, etc. are all increasingly digital, and **these trends**

have accelerated throughout the COVID pandemic. Technology is undoubtedly already a significant but growing part of our daily lives.

Figure 1: Online share of retail sales in the US and UK



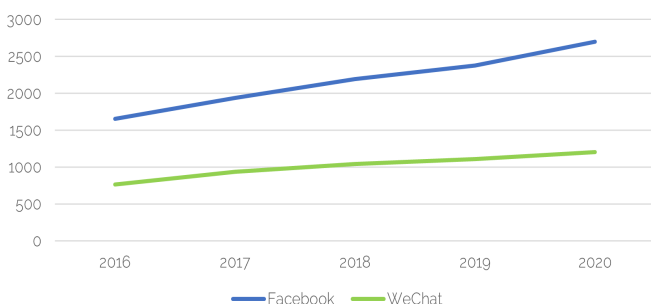
In the US and UK alone, the penetration of online sales has rapidly accelerated.

Source: Dealroom (2020)

The time spent on social media as a consequence of the pandemic has also increased. **Facebook for example, experienced a 50% average surge in messaging across its apps during March** (Facebook, 2020). **Kakao, the Korean platform and one of our holdings, has added almost the same MAUs (Monthly Average Users) in the last two quarters as in all of 2019 for its messaging app.** This is in addition to the phenomenal growth in new users

in new users for Facebook, WeChat (in China), TikTok, etc. that we have seen. In the last five years, Facebook added approximately 800m users to its networking site, whilst **WeChat has almost doubled its userbase to 1.2 billion users.** On the other hand, TikTok usage has exploded, with the userbase just in the US jumping from 11m MAUs two years ago to 92m as of June 2020. These trends are similar both in Developed and Emerging Markets.

Figure 2: Facebook and WeChat Monthly Average Users over the last 5 years



Sources: Facebook and Tencent company presentations (2020)

B rated

Tencent 腾讯



DOES E&S MATTER WHEN ASSESSING TECH COMPANIES?

Technology companies (particularly internet-oriented ones) are not often seen as potentially problematic areas for environmentally conscious investors. The sector is perhaps overlooked, as software apps and streaming websites are entirely intangible – there is no need for a manufacturing process that requires fossil fuels or natural materials with thousands of labourers to create the product. Furthermore, the most physical part of being connected to the internet (i.e. datacentres), are often out of sight and typically housed in ordinary buildings that do not have chimneys that billow smoke into the environment.

However, using this technology still requires energy usage and does not leave a zero-carbon footprint. An estimate by Google in 2009 showed that **a single**

Google search requires the same energy consumption as running a LED bulb for 3 minutes. Whilst energy efficiency gains are likely to have been made since then, the sheer volume of searches has increased exponentially from 792 billion in 2009 to 1.3 trillion in 2019 (over 3.5 billion searches per day!).

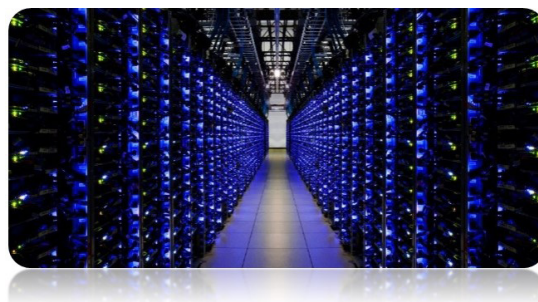
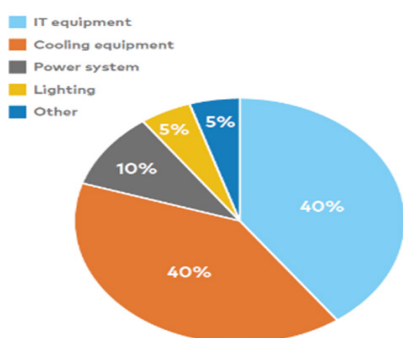


Figure 3: Breakdown of data center electricity consumption (2016)



Source: ClickClean (2016)

The main reason for the oversized energy consumption is the usage of data servers. Currently, **these actually account for 1-2% of total global energy consumption** and various projections estimate that data server energy usage could grow to 11% of total global energy consumption by 2030 (HSBC, 2020). In addition, these data centres are heavy consumers of water as they need to remain cool (see figure 3), and therefore water usage



Modern computing is responsible for about 3% of global Co2 emissions, the same as the entire aviation industry

and water recycling can pose a significant environmental risk. Perhaps most sobering of all, **modern computing is responsible for about 3% of global Co2 emissions** – this matches the Co2 emissions from the entire aviation industry (Yale School of the Environment, 2018).

Figure 4: Electricity Consumption of China's Data Centre Industry (2018-2023)

YEAR	2018	2019	2020	2021	2022	2023
Total Electricity Consumption (TWh)	160.89	178.02	196.96	217.93	241.13	266.79

Source: Greenpeace (2018)

In China alone, electricity consumption derived from the data center industry is projected to grow by almost 70% from 2018-2023 as can be seen above in figure 4 – this is roughly the total electricity consumption for the whole of Australia. Furthermore, the vast majority of the

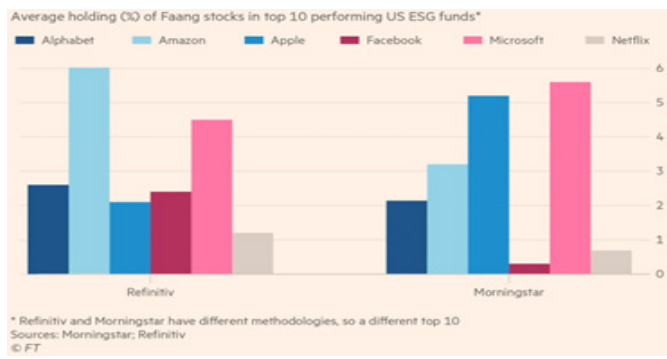
electricity demand is expected to be served by coal fired power stations. Estimates show that companies such as **Baidu, Alibaba, and Tencent sourced around 67% of their energy from coal in 2017** (Greenpeace, 2018).



Alibaba.comTM



Figure 5: Average holding (%) of FAANG stocks in top 10 performing US ESG funds



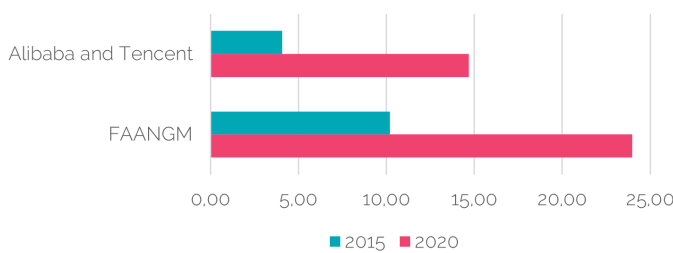
We believe that internet companies should face scrutiny by all ESG and sustainable investors

Source: Financial Times (2020)

Given the potential for major environmental impact, we believe that internet companies should face scrutiny by all ESG and sustainable investors, especially as many ESG & sustainability funds have large weightings in the FAANGM stocks (Facebook, Amazon, Apple, Netflix, Google and Microsoft) per the Financial Times (2020).

Furthermore, **the weighting of the main internet companies has dramatically increased in their respective indices.** In just the last five years, Alibaba and Tencent have more than doubled their share of the leading emerging market index to more than 14% and FAANGM have increased their share of the S&P500 by almost 14% from 10.2% to 24% as we can see below.

Figure 6: Tech weighting has dramatically increased



Alibaba and Tencent have more than doubled their share of the leading emerging market index

Source: Bloomberg (September 2020)

Given the potential for negative environmental and social risks, combined with the increasing weights in their respective indices, we believe that ESG and

sustainable investors should take a much closer look at the E&S performance of such companies. This is an area of increasing focus for Alquity over the coming quarters.

AN ENVIRONMENTAL ANALYSIS OF THE KEY PLAYERS

In order to formulate a strategy to address the environmental and social risks, we first have to understand the current performance of the major

technology companies. We have therefore analysed the environmental performance of the major tech software companies in the US as well as those in EM.

Figure 7: Environmental performance of the key players

	Revenue (millions \$)	Water Intensity (m3/million \$)	Waste Generated per unit of revenue (t/million \$)	Carbon Intensity per unit of revenue (tCO2e/million \$)	Energy Intensity per unit of Revenue (MWh/million \$)	% of Total Electricity obtained from Renewable Sources
Facebook	70697	48,52	Not reported	3,55	72,70	86%
Amazon	280522	Not reported	Not reported	40,14	Not reported	42%
Google	161857	97,53	0,35	4,62	65,32	100%
Microsoft	125000	33,72	0,22	31,56	73,82	95%
Tencent	53923	51,08	0,13	15,89	27,93	Not reported
Meituan Dianping	14051	21,88	0,32	1,52	2,30	Not reported
Baidu	15430	88,33	0,41	19,83	31,80	Not reported
Alibaba	72000	Not reported	Not reported	Not reported	Not reported	Not reported, <20%*
Mercado Libre	2296	24,36	1,37	5,73	13,80	10%

Sources: Company sustainability reports (2020)

* estimates based on Alibaba's ESG 2018 report



In our view, **Microsoft has the strongest metrics in the above sample.** The company has made genuine commitments to reducing their environmental impact and is shown by the lowest water and waste intensity. Whilst the carbon intensity is higher, this is likely due to the slightly different business model as Microsoft has a larger hardware manufacturing component than the peer group. Furthermore, **95% of the electricity Microsoft uses comes from renewable sources and the company aims to become carbon negative by 2030.**

Facebook performs particularly well on carbon intensity, and the company committed to reducing its greenhouse gas footprint by 75% by 2020. Facebook is also a heavy consumer of energy – this is most likely due to operating their own datacentres. However, this is offset by the high percentage of electricity consumption from renewable sources, and additionally **the company aims to reach 100% of renewable energy this year.**

FACEBOOK

C rated

kakao

The most comparable Asian companies are Tencent (China) and Kakao (Korea). **Tencent reports a much higher carbon intensity, and this is likely due to electricity consumption that is ultimately derived from coal.** Kakao, a holding of ours, does not disclose much publicly – however they have disclosed energy consumption at the data centre fleet level (aggregating individual data centre facilities) and electricity consumption data when requested. Given the absence of fleet level energy consumption for peers, this means that we are unable to make a direct comparison. **We have engaged with Kakao's management** and we understand that there are policies to purchase renewable energy (which will increase when a market mechanism is created in Korea). In addition, they prioritise servers that are powered by renewable energy in their procurement process. **We rate Kakao as a C, and we continue to engage for greater disclosure which is necessary for a rating upgrade.**

Optically, **our holding Meituan Dianping** (China's largest hotel booking and food delivery app) **performs very well on environmental metrics.** However this is likely due to the asset light nature of the business (i.e. probably does not operate its own datacentres) which results in a positive bias. Thus our engagement revolves around disclosing their process in choosing a server provider and whether environmental considerations are made.

Interestingly, only one of the three giants of e-commerce provided reasonable environmental disclosures. **Mercadolibre, a holding of ours,** is the largest online commerce ecosystem in Latin America. The company reports relatively low GHG emissions, water and energy consumption on both absolute and revenue intensity measures and have shown **consistent improvements since 2017 in their overall performance** given renewable energy.



However, the other e-commerce giants, **Amazon and Alibaba both share a similar poor level of disclosure.** Amazon provides little information on water, waste and total energy consumption – however, **the company has made significant 'climate pledges'** whereby the company has committed to net zero carbon emissions by 2040 and 100% of energy is to be derived from renewable sources by 2030. However, **the lack of disclosures and initiatives by Alibaba are particularly disappointing,** and particularly given the scale of the Chinese market:

- China's data centres are the second largest in world with 8% market share.
- There are 1.2m server racks which uses a floor area of 18,400,000m² – this is equivalent to 2577 football pitches.
- China's data centre industry consumed 161 TWh of electricity in 2018 – this is the same electricity consumption as the whole of Thailand.
- The market is growing rapidly at approximately 30% per year.
- There is a huge ultimate reliance on coal.

Given the above, and China's increasing focus on environmental issues, we would expect that Alibaba, the domestic market leader, to make reasonable disclosures and have significant initiatives. However, our research showed that **Alibaba only started to produce an ESG report in 2018 and lacked detailed disclosures on energy usage.** Whilst we choose to not own Alibaba for governance reasons, we believe there is also significant room for improvement on environmental matters and **suggest that shareholders should engage with Alibaba to improve their data transparency, as well as influencing the company to use less coal and more renewable energy sources.**

ANALYSIS OF THE SOCIAL PERFORMANCE OF THE KEY PLAYERS

Figure 8: Social performance of the key players

	Equal Employment Opportunity Statement	Women (% of workforce)	Women in management (% of management)	Average Employee Tenure (Years)	Audit of supply chain	Health and Safety Policy	Employee Satisfaction (Glassdoor rating)
Facebook	Yes	37%	33%	2.5	Yes	Yes	4.4
Amazon	Yes	43%	28%	1	Yes	Yes	3.9
Google	Yes	32%	27%	3.2	Yes	Yes	4.4
Kakao	Yes	39%	Not reported	5	Yes	Yes	4.1
Tencent	Yes	Not reported	Not reported	Not reported	No evidence saying they do	Yes	4.2
Meituan Dianping	Yes	Not reported	Not reported	Not reported	Assesment	Yes	4
Mercado Libre	Yes	41%	28%	Not reported	No evidence saying they do	Yes	4.3

Source: Company sustainability reports (2020)

As with the aforementioned Environmental disclosure, US companies again tend to produce more data in terms of Social factors. All US companies reported various diversity measures such as women as a percentage of the workforce, and management. As an external check, all companies score well on Glassdoor (employee satisfaction website). Lost Time due to Injury (LTI) is perhaps more relevant for e-commerce companies given there is substantially more physical work as compared to predominantly software companies. Disappointingly, this is not reported by Amazon nor Alibaba.

A closer look at Amazon would suggest that employee welfare is an area for potential improvement. A detailed report by the New Yorker (2019) showed that warehouse workers are under severe pressure to meet productivity targets. They reported that there appears to be a toxicity in the culture, as injured employees are sometimes not offered time off to recover, and other workers have become permanently injured. **Alibaba also endorses a controversial work ethic;** in 2019, Jack Ma publicly supported the “996” work practice (9am to 9pm, 6 days a week). This was heavily criticised by employees as well as Chinese state media. In particular the People’s Daily (a state-run newspaper) wrote “the mandatory enforcement of 996 overtime culture not only reflects the arrogance of business managers, but also is unfair and impractical.”

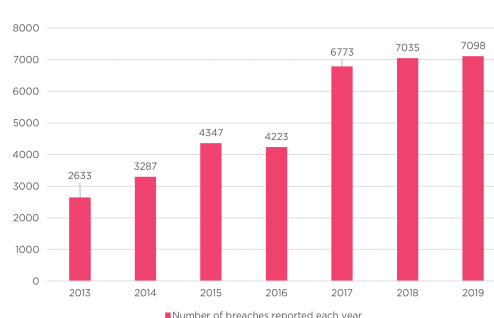
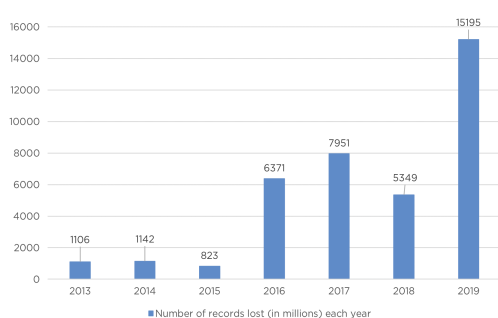
Interestingly, average employee tenure tends to be quite low at the US companies - in particular, the average Amazon employee only stays for one year. This is not entirely unusual given the workforce comprises of young and highly-skilled workers. However, it can also

be an indication of poor employee welfare as previously mentioned. We do note that our holding Kakao reports the highest employee tenure at five years which is an indication of employee satisfaction. In addition, the audit of supply chain is consistently strong across the US companies as well as Kakao. However, Tencent and Mercado Libre do not and we will engage with them to disclose this information.

Another topical issue is data security. We see several key areas that should be addressed: data privacy (i.e. consent, usage, etc.) and data breaches (e.g. leaks, hacks). Risk Based Security (RBS), a provider of breach data and vulnerability intelligence reported that in 2019 alone, more than 7000 breaches occurred on the internet (e.g. as a result of software vulnerabilities), as can be seen in the figures 9 and 10 below, with more than 15 billion consumer records comprised.

Even the major tech companies have seen numerous reported data scandals in recent years. In 2018, Google had inadvertently exposed the private data of hundreds of thousands of users and opted not to disclose the issue to the regulators for fear of regulatory scrutiny and reputational damage (WSJ, 2018). Facebook has recently been embroiled in the Cambridge Analytica scandal whereby Facebook users’ personal data was retrieved without consent and used for political advertising. Conversely, **our holding Kakao has had relatively few breaches and with a less significant impact** - having engaged with them, we attribute this to the higher data privacy standards in Korea, as well as Kakao’s commitment to keeping data safe as seen by significant investments in security.

Figures 9 and 10: Number of data breaches and number of records lost as a result of the breaches

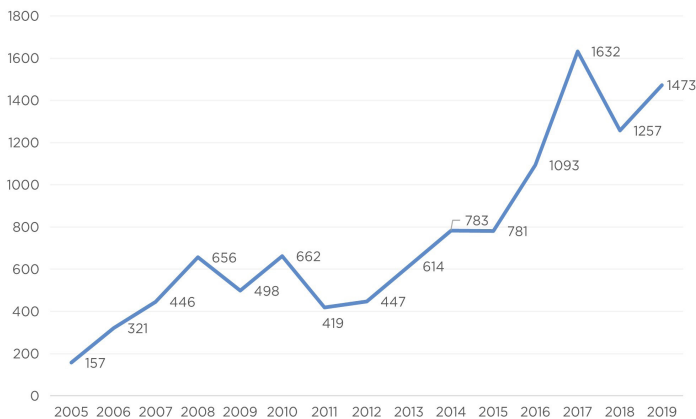


Source: Risk Based Security (2019)

Most forms of data-related scandals can lead to loss of revenues, reputational damage, regulatory fines and increased security costs. Hence, we believe it is important to formulate an effective engagement strategy to understand where the risks lie, and whether

companies are sufficiently prepared to prevent such scandals. In addition, companies should have an appropriate response mechanism if such a breach did occur.

Figure 11: Annual number of data breaches in the US



We believe it is important to formulate an effective engagement strategy to understand where the risks lie and prevent such scandals

Source: Statista, 2020

WHAT SHOULD INVESTORS DO IN RESPONSE TO THE ENVIRONMENTAL AND SOCIAL RISKS?

In our opinion, investors should build an engagement strategy

The potential for significant negative environmental and social impact from internet companies should not be underestimated. Combined with the fact that Technology forms a prominent part of many investor's portfolios, we believe that internet companies face scrutiny by all ESG and sustainable investors. In our view, this can be addressed by building an engagement strategy.

We outline our approach to engagement which broadly aims to understand: a) the potential social and environmental impact brought about by the company b) the preventative measures and incentives in place to reduce the risk of a significantly negative impact event materialising and c) what negative events have occurred previously, how meaningful were they, and how was this addressed (reparations and preventive actions taken).

Engagement topics for data centre companies

Environmental

- Do you disclose energy and water usage?
- What forms of energy are used (coal, natural gas, renewables etc.)?
- How is the water collected, recycled and discharged?
- What energy and water saving initiatives are there?

- Do you disclose emissions (carbon scope 1-3, nitrogen, etc.)?
- What emission saving initiatives are there?
- Are there explicit targets to reduce energy, water and emissions?
- And is this formally included into the company targets/linked to management bonuses?

Social

- Cyber security / data privacy policy
- What security measures are in place to avoid theft by both outsiders and employees?
 - How much is invested in security? How has this changed over time?
 - Is there regular and sufficient training for employees?
 - Is there a credible threat towards improper behaviour?

- Have there been any incidences of breaches in the past?
 - If so, what happened, what was the impact, and what preventive measures were put in place?
- What is the protocol for when breaches occur?
 - Is there a whistleblowing policy?

Engagement topics for social media companies

Environmental

- Do you operate your own servers?
 - If yes, see engagement for data centres
 - If no, engage with company to see if they include the engagement questions in their procurement process for choosing a cloud service

Social

- What data do you collect?
 - Who has access to the data and why?
 - Is this anonymised?
- What preventive measures are there for breaches?
- Have there been any incidences of breaches in the past?
 - If so, what happened, what was the impact, and what preventive measures were put in place?
- What is the protocol for when breaches occur?
 - Is there a whistleblowing policy?
- What is your content policy? (e.g. restricting adult material, racist material, etc.).

Engagement topics for e-commerce companies

Environmental

In addition to the above points:

- Do you disclose paper/cardboard usage?
- Are there explicit targets/initiatives to reduce paper/cardboard?

Social

In addition to the above points in social media engagement:

- Do you disclose Lost Time due to Injury (LTI), workplace accidents, fatalities, etc.?
 - What has been the trend for these wellbeing statistics?
 - Are there explicit targets/initiatives to reduce the above?

transformation

CONCLUSION

Whilst internet companies have been a major source of productivity gains and a significant contributor to economic growth, these companies may result in significantly negative environmental impact and social outcomes. This seems to have been largely ignored by investors.

At Alquity, we therefore take engagement here just as seriously as in other higher risk industries, and **continuously engage with our holdings to ensure that management have the appropriate mindset towards environmental**





and social performance, looking to the US internet giants for examples of best practice. We believe that this is essential as if the aforementioned risks were to materialise, there could be a significant impact on a company's share price performance.

We intend to increase our focus in this area over the coming months, as this sector has become a meaningful part of our portfolios.

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