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Amazon, Apple and Google are gobbling up the world's energy. What are they doing about it?

Data centres already emit over 2pc of the world's greenhouse gas emissions   CREDIT: BENOIT TESSIER

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By **Natasha Bernal** and **Tom Hoggins**

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It is oil companies which are usually <u>labelled as the villains behind drastic climate change</u> (https://www.telegraph.co.uk/business/2018/11/07/big-oil-named-shamed-church-climate-sins/), with fossil fuel giants like Shell and ExxonMobil frequently blasted for their role in creating pollution.

But big technology companies including Amazon, Facebook, Google, Apple and Microsoft are also under mounting pressure to make a difference in the fight against climate change.

Their powerful data centres – energy guzzling heat machines that store all of the information in the online world- already emit over 2pc of the world's greenhouse gas emissions.

But the growth of video streaming and cloud services means this is on track to rise five-fold in the next seven years.
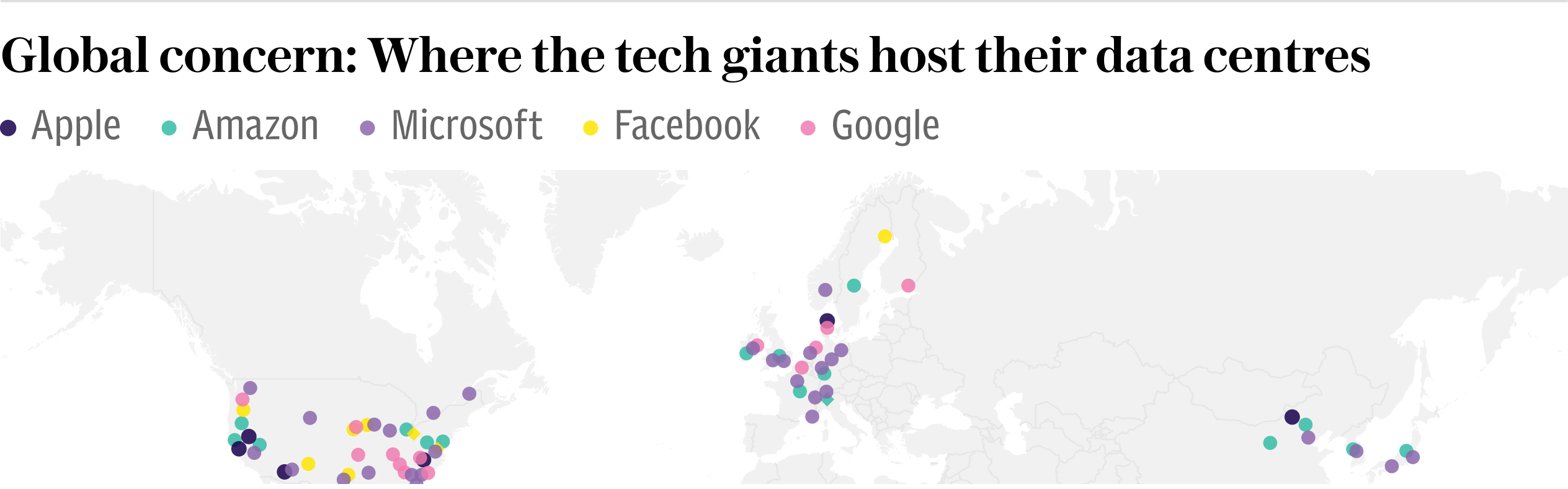
Research has shown that over 100bn internet connected devices could use 20pc of the world's energy and produce 3.5pc of the world's emissions by 2025; more than aviation and shipping.

Our growing appetite for reading and sharing online information, using social media sites like Facebook and Twitter, as well as services including Netflix and Amazon Prime could literally kill our planet.

The US state of Virginia is the "biggest hotspot" in the world for technology companies, explains Gary Cook, senior corporate campaigner at Greenpeace. Ashburn, in the Northern Virginian site of Dulles Technology Corridor, currently houses over 100 large data centres. He claims that the energy consumed by Amazon's data centres in Virginia is the equivalent of all the homes in Chicago.

"Amazon has almost half of their global data centres in Virginia," he says. Virginia has been labelled <u>"Data center Alley"</u> (https://www.greenpeace.org/usa/reports/click-clean-virginia/), and his organisation claims that 70pc of the world's internet traffic passes through its borders.

"Data centres are projecting huge growth in big part by 5G and what 5G enables, and the IoT (internet of things) universe which we are in already," he says. "So they build bigger data centres and build them faster."

Global concern: Where the tech giants host their data centres

● Apple   ● Amazon   ● Microsoft   ● Facebook   ● Google

Technology companies have resorted to increasingly desperate measures to lower the amount of energy they consume. Many have opened data centres in colder climates to reduce the gallons of water pumped into data centres to cool them.

Microsoft decided to sink a data centre in the North Sea, Google uses seawater from the Gulf of Finland to chill its Hamina servers, and Facebook launched a data centre on the edge of the Arctic Circle in Sweden.

US energy company Green Mountain has a data centre in the middle of a mountain, cooled by the "cold waters of a Norwegian fjord".

In perhaps the most extreme example yet, the World Data Archive promises clients their data will be safe from nuclear blasts in a converted mine on an island deep in the Arctic mountains of Norway, which is under permafrost conditions.

But wherever these centres are, they consume vast amounts of energy. As the number of energy-guzzling data centres around the world increases, technology giants behind them are under increased pressure from shareholders and governments to make them sustainable. Many of them have answered with grand pledges to reduce their carbon footprint.

Google reveals top-secret data centres powering the world's largest search engine

Microsoft plans to cut its company-wide carbon emissions by 75pc by 2030. The company's president Brad Smith outlined his green energy plan in a blog post last month (https://blogs.microsoft.com/on-the-issues/2019/04/15/were-increasing-our-carbon-fee-as-we-double-down-on-sustainability/), and said Microsoft had reached its 50pc green energy target for the end of 2018. Facebook says it is committed to reducing its greenhouse gas footprint by 75pc and reaching 100pc renewable energy by 2020.

Similarly Amazon, with its Shipment Zero plan, has pledged to cut its delivery emissions in half. However, the e-commerce giant was accused of breaking its commitment to power cloud with 100pc renewable energy earlier this year, after a report from Greenpeace claimed that its data centres in Virginia are powered by only 12pc renewable energy.

A spokesman for AWS claimed the report was "inaccurate" and that Greenpeace had not performed "proper due diligence by fact-checking with AWS before publishing". The company since said it aims to be 100pc carbon neutral and plans to share its company-wide carbon footprint.

Carbon neutrality --where a company's emissions are balanced out by carbon savings elsewhere -- is a goal that many tech giants have also said they are committed to. Microsoft says it has been carbon neutral since 2012, Google since 2007.

Apple says that its operations, including data centres, are now powered wholly by clean energy. It spent 1.3 billion kWh of green electricity in the 2018 fiscal year to power its data operations. Apple was named the world's most environmentally friendly technology company by Greenpeace in 2018, Microsoft was fourth.

Apple says it is also pushing the companies it partners with to follow suit.

"44 of our manufacturing partners have committed to power all of their Apple production with green energy," Lisa Jackson, Apple's vice president of Environment, Policy and Social Initiatives told The Telegraph last month on the launch of the company's sustainability report.

"Forward-looking, smart businesses that are focused on the future and not the past believe that they should be on the front foot in climate change, they believe the climate will have a real impact on their future, clean energy is genuinely cost competitive now," Jackson said.

Google financed its own solar and wind farms to curb the use of carbon energy in data centres. In 2017, the company claims, it finally hit its 100pc target. Now it is working on powering the entire company through green energy.

Few technology companies can afford to make such drastic commitments.

"They all have some work to do," says Cook. "There is a selection of global brands who are taking this seriously and want to make sure that they are not a bigger part of the problem. The problem is that this is invisible for most people. It's out of sight. The internet can be a good tool to spread things but it is consuming more and more."

Data centre provider Equinix, which hosts data from the likes of Amazon, Apple, Facebook and Nokia, this week formally launched its latest London-based data centre, a £90m venture that will house data for big corporates.

Eric Schwartz, chief strategy and development officer at Equinix, says that his company wants to use renewable sources as well as introducing efficiencies to stop losing energy such as heat and cooling power from data centres. Equinix is in line to hit its 90pc target for renewable energy this year.

"This year we will be investing at least £40m just in those types of efficiency activity, above and beyond," he says.

Schwartz argues that while data will continue to grow at "incredible rates" because of 5G, the offset is that equipment will steadily get more efficient at storing it.

The danger is that there won't be enough renewable energy available for technology companies to continue on-track to sustainability.

"We want the utility grid to be sustainable," says David Rinard, director of global sustainability at Equinix. "Corporations getting involved in this is adding pressure to the utilities.We are going green on our own in spite of utilities, in an effort to drive utilities to go green. Once they are green we can just buy their power."

Britain has become a hot spot for new data centres. Equinix will join Amazon, Google and Microsoft, which all have a presence here.

But the UK's popularity with technology companies may hinder its plans to go green. This week, Britain was issued a deadline (https://www.telegraph.co.uk/business/2019/05/02/three-cheers-climate-committee-no-cost-zero-emissions/): phase out greenhouse gas emissions completely by 2050 in order to meet the expectations of the Paris Agreement.

If this zero-emissions target is accomplished, it will be the most ambitious move yet by any country to combat global warming, government advisers claim, and could push other countries to follow the lead.

The government was advised to invest in carbon capture technology, which strips emissions from factory flues before they enter the air, as a solution to this issue.

All of this comes in response to climate change hitting the headlines as Extinction Rebellion protestors took to the streets to warn against environmental damage (https://www.telegraph.co.uk/news/2019/04/24/extinction-rebellion-climate-protesters-will-end-london-road/). Armed with a garish pink boat, thousands of people with placards blockaded central London for days to protest against climate change, chanting and doing yoga under the uncharacteristically hot Spring sunshine. Watch out, they warned, this planet is running out of time.

And with the greater impact of data centres around the world, tech giants will need to ensure they are doing enough to beat the clock.

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