# Group 2 – Microsoft’s Moonshot

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| *Assignment:** *Answer the following questions :*
	+ *Slide 1: Present Microsoft’s “climate initiative”*
	+ *Slide 2: Is “Microsoft’s “climate initiative”” a moonshot?*
	+ *Slide 3: Why is Microsof targeting this moonshot? Why is it counter-intuitive?*
	+ *Slide 4: What are the Open Innovation practices?*

*Remark : use the articles to construct the answer but you can also develop answer we ideas that are not in the articles**The group has to present their answers in 15 minutes*  |

## [Nives Dolsak and Aseem Prakash](https://www.forbes.com/sites/prakashdolsak/) (2020), The Climate Leadership Race: Microsoft’s Climate Moonshot and Amazon’s Climate Pledge, *Forbes* <https://www.forbes.com/sites/prakashdolsak/2020/01/17/the-climate-leadership-race-microsofts-climate-moonshot-and-amazons-climate-pledge/?sh=38e4e3646298>


The competition among the two Seattle-based tech giants seems to be headed in an unexpected direction: climate leadership. On September 19, 2019, Amazon announced its [Climate Pledge](https://www.forbes.com/sites/prakashdolsak/2019/09/20/amazons-climate-pledge-greenwashing-or-a-game-changer/#7e0061a355b6). Today, [Microsoft](https://blogs.microsoft.com/blog/2020/01/16/microsoft-will-be-carbon-negative-by-2030/) outlined its climate initiative. We call it the Climate Moonshot, inspired by Microsoft President Brad Smith’s blog post, in which he noted: “This is a bold bet — a moonshot — for Microsoft. And it will need to become a moonshot for the world.”

Recall the key aspects of Amazon’s Pledge: 100% renewable energy by 2030, net-zero emissions by 2040, the induction of 100,000 electric vehicles into the delivery fleet, a $100 million investment in reforestation projects, and a website to track and report on these commitments.

The Climate Moonshot wants Microsoft to shift to renewable energy for its buildings and data centers by 2025, become “carbon negative” by 2030, and remove its historical carbon emissions from the atmosphere by 2050. Carbon negative means that Microsoft will remove more carbon from the atmosphere than emitted by its direct activities and its [entire supply chain](https://www.eenews.net/eenewspm/2020/01/16/stories/1062098791).

Microsoft’s plan is more ambitious than Amazon’s. Microsoft will transition faster to renewable energy for buildings and data centers (by 2025 versus 2030 for Amazon) and to net-zero emissions (by 2030 versus 2040 for Amazon). Moreover, while Amazon committed to net-zero emissions for its operations only, Microsoft’s plan will cover its entire supply chain. Even more remarkably, unlike Amazon, Microsoft takes responsibility for its historical emissions, with the pledge to remove them from the atmosphere by 2050. In sum, Microsoft is ahead of Amazon in Round 1 of the climate marathon.

**Why Did Microsoft Announce its Climate Moonshot Now?**

Until recently, Microsoft was considered somewhat of a climate laggard among the high-tech giants. Previously its goal was 70% renewable energy for its data centers and buildings by 2023, while Google and Apple were already at 100%.

So what happened? A confluence of factors, we suspect. Climate change is in the news recently due to fires in Australia, the proposed [rollbacks](https://www.huffpost.com/entry/trump-nepa-rollback-climate_n_5e166c2ec5b600960c5f72d8) in the implementation of the National Environmental Policy Act, and the annual letter of [BlackRock CEO Larry Fink](https://www.npr.org/2020/01/14/796252481/worlds-largest-asset-manager-puts-climate-at-the-center-of-its-investment-strate), where he placed climate change as the top issue in capital allocation. [Climate change also leads the agenda](http://www3.weforum.org/docs/WEF_AM20_Overview.pdf) for the forthcoming World Economic Forum meeting in Davos. Hence, Microsoft’s announcement, by design or otherwise, has capitalized on the increased media salience of climate issues.

Further, Amazon was in the news last week because it cracked down on members of [Amazon Employees for Climate Justice](https://medium.com/%40amazonemployeesclimatejustice/amazon-employees-are-joining-the-global-climate-walkout-9-20-9bfa4cbb1ce3). Its ostensible reason was that [they spoke to the press](https://cdn.geekwire.com/wp-content/uploads/2020/01/PR_-01_02_20-Amazon-threatens-to-fire-workers-speaking-out-on-the-companys-role-in-the-climate-crisis.pdf) about Amazon’s climate policies without prior authorization. Microsoft faced similar [employee activism](https://github.com/MSworkers/for.ClimateAction) during the September 2019 [Climate Strike](https://www.forbes.com/sites/prakashdolsak/2019/09/14/climate-strikes-what-they-accomplish-and-how-they-could-have-more-impact/#578587f65eed). Yet, instead of silencing its employees, Microsoft launched the Moonshot.

**Taking Responsibility for Historical Emissions**

The most striking feature of Microsoft’s Climate Moonshot is acknowledging responsibility for its historical emissions and pledging to remove all the carbon emitted to date, either directly or through its supply chain. This makes scientific sense because the climate crisis is caused by accumulation of past emissions.

The 1992 [United Nations Framework Convention on Climate Change](https://unfccc.int/resource/docs/convkp/conveng.pdf) recognized the issue of the historical responsibility of developed countries in contributing to emissions. It formulated the principle of common but differentiated responsibility whereby developed countries (Annex I) were mandated to reduce emissions but developing countries (non-Annex I) faced no such mandatory obligations. Microsoft’s Climate Moonshot is probably the first time a major company has recognized its historic responsibility for climate change.

One could argue that this is not a big deal for Microsoft because it is a relatively young company founded in 1975. Further, before its cloud business took off, its carbon footprint was probably marginal. Hence, removing historical emissions is a low-hanging fruit. In contrast, automobile, steel, and cement companies, which have been operating in a carbon-intensive manner for a long time, will probably bear significant costs to remove their historical emissions. Even Amazon, which started as an online book retailer in 1994 (probably with a sizeable supply chain carbon footprint) and launched the AWS platform in 2002 (which is highly energy-intensive), could have accumulated a sizeable carbon footprint.

Maybe Microsoft is just being clever. But it is establishing a new standard for corporate climate responsibility. While shareholders tend to focus on returns on investment today and tomorrow, Microsoft is asking them to take into account its past operations as well. This signals a crucial shift in the corporate mindset.

**Greening the Supply Chain**

Amazon’s Climate Pledge glossed over the issue of greening the supply chain. In contrast, Microsoft takes this issue head-on. The Moonshot [announcement](https://blogs.microsoft.com/blog/2020/01/16/microsoft-will-be-carbon-negative-by-2030/) identifies three tiers of carbon emissions:

Scope 1: “direct emissions that your activities create — like the exhaust from the car you drive”,

Scope 2: “indirect emissions that come from the production of the electricity or heat you use”, and

Scope 3: “For a business, these emission sources can be extensive and must be accounted for across its entire supply chain, the materials in its buildings, the business travel of its employees, and the full life cycle of its products, including the electricity customers may consume when using the product”.

As per Microsoft’s estimates, Scope 1 emissions are a minuscule percentage of its total 2019 emissions of 14 million metric tons. Scope 2 emissions account for about 25% and Scope 3 for the remaining 75%. Thus, Microsoft is recognizing that the real emission challenge pertains to the supply chain (Scope 3).

How will Microsoft pay for emission reductions? This is where a carbon tax comes in. While the State of Washington voted down a carbon tax in 2016 and 2018, Microsoft “voted” it in as early as 2012. Microsoft imposes an internal carbon fee on emissions from Scope 1 and Scope 2 activities. Now it plans to extend this to Scope 3 as well. These proceeds will be invested in emission-reduction and carbon capture activities, including R&D, so that Microsoft becomes carbon negative by 2030.

**Yet, No Company Wants to Walk Away From the Fossil Fuel Industry**

Both Amazon and [Microsoft](https://news.microsoft.com/2019/09/17/schlumberger-chevron-and-microsoft-announce-collaboration-to-accelerate-digital-transformation/) sell their cloud services (such as artificial intelligence) to the oil and natural gas industry, thereby helping them explore and extract fossil fuels more efficiently. Herein lies the contradiction. One cannot be a climate champion and yet support oil and gas exploration.

We are not making the case for abruptly shuttering these industries, which employ millions of individuals across the globe. The world still substantially depends on fossil fuels and will continue to do so in decades to come. But climate leaders should work towards the soft landing of the fossil fuel sector so that energy transition does not disrupt the economy and the society. Appalachia's economic and social collapse should not be replicated at the global level.

The first step towards a soft landing is to stop developing new fossil fuel resources. Every new oil or gas well increases fossil fuel supply that keeps their prices down. It creates stranded assets, thereby delaying energy transition and making it more complex.

Microsoft has challenged the high tech industry to become climate leaders. It has committed to ambitious targets, particularly in the realm of greening the supply chain. It has acknowledged its historical emissions, and it has pledged to remove them from the atmosphere. However, it continues to assist fossil fuel firms in expanding the supply of fossil fuels, which raises doubts about its commitment to prioritizing climate over short-term profits.

[Nives Dolsak and Aseem Prakash](https://www.forbes.com/sites/prakashdolsak/) - Nives Dolsak is Stan and Alta Barer Professor in Sustainability Science and Director of the School of Marine & Environmental Affairs. is the Walker Family Professor and the Director of the Center for Environmental Politics. Both are at the University of Washington, Seattle.

## [Oscar Schwartz](https://www.theguardian.com/profile/oscar-schwartz) (2020), " Could Microsoft’s climate crisis ‘moonshot’ plan really work? “, theguardian.com, <https://www.theguardian.com/environment/2020/apr/23/microsoft-climate-crisis-moonshot-plan>

*The tech giant’s pledge to go carbon negative by 2030 leans heavily on nascent technology such as machines that suck carbon out of the air*

[](https://www.theguardian.com/environment/2020/apr/23/microsoft-climate-crisis-moonshot-plan%22%20%5Cl%20%22img-1)‘We’re just trying to do what the science says the whole world needs to do,’ said Lucas Joppa, chief environmental officer at Microsoft. Illustration: Greg Betza/The Guardian

Microsoft drew widespread praise in January this year after Brad Smith, the company’s president, [announced](https://blogs.microsoft.com/blog/2020/01/16/microsoft-will-be-carbon-negative-by-2030/) their climate “moonshot”.

While other corporate giants, such as Amazon and Walmart, were pledging to go carbon neutral, [Microsoft](https://www.theguardian.com/technology/microsoft) vowed to go carbon negative by 2030, meaning they would be removing more carbon from the atmosphere than they produced.

By 2050, Smith added, the company was aiming to remove all of the carbon they had ever emitted since being founded in 1975.

The firm’s promises won plaudits from [conservationists](https://twitter.com/sallyjewell) and [climate conscious](https://twitter.com/markjacobsohn/status/1218019743015358465?s=20) Microsoft employees, but also attracted big questions: how are they going to actually deliver this?

Much of its plans lean on nascent technology. Critics, meanwhile, see the move as a gamble aimed at justifying Microsoft’s ongoing deals with fossil fuel firms.

Microsoft releases less carbon a year than [Amazon](https://sustainability.aboutamazon.com/carbon-footprint) and [Apple](https://www.apple.com/environment/pdf/Apple_Environmental_Responsibility_Report_2019.pdf), but more than Google. The company has 150,000 employees across offices in more than 100 countries, and is still focused on developing the software and consumer electronics that made them a household name – Windows, PCs, Xbox. But after a temporary slump following their heyday in the 1990s, they have also once again become innovators, developing world-leading artificial intelligence (AI) and cloud computing products.

The company hopes to bring that innovative approach to its climate policies, in part by widening how it calculates its carbon footprint, beyond most corporate responsibility plans. Historically, Microsoft has only counted those emissions that fall within the scope of their own business operations – employee travel, company vehicles, heat and electricity in company buildings, and so on.

From now on, it plans to take responsibility for the emissions produced by its entire supply chain, including the full lifespan of the products it makes and the electricity that customers may consume when using its products.

Meanwhile, increasing the scrutiny on Microsoft’s plan are its dealings with fossil fuel companies, which have been highlighted by some as evidence of hypocrisy as it makes climate pledges. In 2019 alone, the technology company had entered into long-term partnerships with three major oil companies, including ExxonMobil, that will be using Microsoft’s technology to expand oil production by as much as 50,000 barrels a day over the coming years. The staggering amount of carbon this would release into the atmosphere would not be included on Microsoft’s expanded carbon ledger.

It will cost them money, but it will allow the technologies to come online and for the next company to follow their footsteps

For Microsoft, however, partnering with oil companies is not considered hypocritical. The company is hedging its climate bets on carbon capture and removal technologies that they believe will be able to offset some of the environmental harm caused by fossil fuels during the transition to a more sustainable future, despite such technologies being still in their nascent stages and not yet proven to work at scale.

Those who devised the plan at Microsoft argue that they are responding directly to a new reality: cutting emissions is not enough and all routes to non-catastrophic temperature increase will also require removing carbon from the atmosphere. So, as well as shifting to a 100% supply of renewable energy for all of their data centers, buildings and campuses by 2025, Microsoft outlines a number of carbon reduction methods it is backing to try and hit its bold targets.

### Protecting forests

To begin, Microsoft will focus on protecting forests and planting trees to capture carbon. This strategy has long been used to offset emissions, but Microsoft is hoping to improve their outcomes by [using](https://news.mongabay.com/2020/02/success-of-microsofts-moonshot-climate-pledge-hinges-on-forest-conservation/) remote-sensing technology to accurately estimate the carbon storage potential of forests to ensure no major deforestation is occurring in their allotments. To achieve these goals, Microsoft will be partnering with Pachama, a Silicon Valley startup that will survey 60,000 hectares of rainforest in the Amazon, plus an additional 20,000 hectares across north-eastern states of the US for the company.

According to Kelsey Perlman, a climate campaigner at the forest conservation NGO Fern, Microsoft’s commitment to hi-tech reforestation is encouraging, but she stressed that conservation is a complex, multifaceted process that goes beyond technical issues. “It’s not only about how much carbon a forest can hold but also who traditionally uses the forest, how they might be kept out, and how biodiversity will be prioritized,” she said.

### Biomass energy carbon capture storage

Microsoft will initially focus on nature-based solutions to reduce their carbon footprint over the next five or so years. But in order to start drawing more carbon from the atmosphere than they emit by 2030, it will need to shift to technology-based solutions that can scale up and accelerate carbon removal.

To this end, Microsoft is betting on biomass energy carbon capture storage, otherwise known as BECCS, to transform how energy is generated. Instead of burning coal, a BECCS power plant burns biomass, like wood chips. The carbon produced when burning the biomass is captured before it is released into the atmosphere and then injected at a very high pressure into rock formations deep underground. Not only does this remove carbon from the natural cycle, the biomass absorbs CO2 as it grows.

[](https://www.theguardian.com/environment/2020/apr/23/microsoft-climate-crisis-moonshot-plan%22%20%5Cl%20%22img-2)Scientists are not yet certain if biomass energy will be carbon neutral.

A world powered by biofuel, however, raises two looming questions. First, scientists are not yet certain if biomass energy will be carbon neutral.

The second concern is that the transition from coal to biofuel would require setting aside vast tracts of arable land – some [estimates](https://www.fern.org/fileadmin/uploads/fern/Documents/Fern%20BECCS%20briefing_0.pdf) say one to two times the size of India. According to climate campaigner Perlman this would mean that the energy industry would probably have to compete with food production in a world where 10 billion people will need to be fed, while vastly enlarging industrialized plantations and reducing biodiversity. “We would likely see massive land use change and massive private purchases of land, the knock on impacts of which could be quite dangerous,” she said.

### Direct air capture

Perhaps the most futuristic of the technologies outlined in Microsoft’s carbon negative plan is [direct air capture](https://carbonengineering.com/our-technology/) (DAC). This involves machines that essentially function like highly efficient artificial trees, drawing existing carbon out of the air and transforming it into non-harmful carbon-based solids or gasses.

While the image of air-conditioner-like machines sucking carbon out of the air is captivating, capturing CO2 directly from the atmosphere [requires](https://www.vox.com/energy-and-environment/2018/6/14/17445622/direct-air-capture-air-to-fuels-carbon-dioxide-engineering) a lot of energy and is very expensive. In 2011, extracting carbon from the air cost $600 a ton of CO2. In 2018, estimates [brought](https://www.technologyreview.com/s/611369/maybe-we-can-afford-to-suck-cosub2sub-out-of-the-sky-after-all/) this down to anywhere between $94 to $232 a ton. But given that Microsoft expects to emit 16m metric tons of carbon this year, if they were to reach carbon zero using only DAC, their bill might cost as much as $3.5bn.

According to Lucas Joppa, chief environmental officer at Microsoft, a large part of the reason why carbon removal remains so expensive is because the markets around these technologies are still immature. The company’s strategy over the coming decades is maturing these markets through intensive and directed investment. “We’re making a bet on certain technologies that don’t exist at the scale or price point we need them to,” he said. “But if we want to get them, we need to start investing.”

The company, he said, already has a model for raising funds internally to support climate innovation. In July 2012, Microsoft became one of the first companies to [institute](https://www.theguardian.com/sustainable-business/microsoft-internal-carbon-fee) an internal carbon price, charging different divisions in the business $15 a metric ton of carbon emitted. The funds raised were then used to pay for sustainability improvements, which helped the company achieve their goal of going carbon neutral.

Previously, this carbon price only extended over emissions Microsoft was directly responsible for. According to their new plan, in July this year Microsoft will extend this internal carbon price over emissions produced across direct and indirect emissions. The increased revenue raised from the expanded internal carbon tax, along with a $1bn climate innovation fund, will be used to invest in capture and removal technology. “What we’re going to do is put this money in the market in a way that is highly additional,” Joppa said. “This is how we’re going to get nature-based solutions and tech solutions at a price point and scale we need.”

Microsoft’s plan for intensive investment in this industry is exciting for those working in the field. Klaus Lackner, a theoretical physicist working on DAC, has been arguing since the 1990s that carbon removal is the only feasible way to stop significant temperature rises. “We’ve shown that this method is technologically feasible, but nobody has wanted them,” he said. “Microsoft have said ‘we get it’. It will cost them money, but it will allow the technologies to come online and for the next company to follow their footsteps.”

While the technologies that Microsoft are betting on are still in their nascent stages, in the past few years there has been some encouraging progress in the negative emissions industry. Lackner and Arizona State University recently signed a deal with Silicon Kingdom, an Irish-based company, to manufacture his carbon-suck machines. The plan is to install them on wind and solar farms, and then sell the captured carbon to beverage companies to make carbonated drinks. In the UK, Drax power plant, which was once among Europe’s most polluting, [has transitioned from coal to biomass](https://www.theguardian.com/business/2020/feb/27/drax-power-plant-to-stop-burning-coal-with-loss-of-230-jobs).

[](https://www.theguardian.com/environment/2020/apr/23/microsoft-climate-crisis-moonshot-plan%22%20%5Cl%20%22img-3)

Part of Microsoft’s carbon removal strategy is to store carbon underground.

But many attempts at scaling carbon negative projects have also failed. The Kemper Project in Mississippi, which was billed as America’s flagship carbon capture project, was [abandoned](https://www.theguardian.com/environment/2018/mar/02/clean-coal-america-kemper-power-plant) in 2017 – it was $5bn over budget, three years late and still not operational.

### Moral hazard

Given the not insignificant risk of failure, some [propose](http://smartstones.nl/wp-content/uploads/2016/12/Kevin-Anderson-2016.10.13-the-Trouble-with-Negative-Emissions-Science-2016.pdf) that relying on nascent or future technology as a solution to the climate crisis represents a moral hazard – the promise of carbon removal functions as an incentive for governments and major polluters to not change their behavior now.

It’s extremely hard to lead if there’s no one there to follow

Lucas Joppa, chief environmental officer at Microsoft

According to Chris Adams, a tech worker who organizes an [online community](http://climateaction.tech/) of technology professionals agitating for climate action from within the industry, the fact that Microsoft is still partnering with big oil companies demonstrates the moral hazard in action. “They are protecting the fossil fuel industry from changing while the rest of the world will pay most from this gamble if it fails in the long term,” he said.

Adams added that many of the encouraging ideas around carbon reduction in Microsoft’s plan have come from internal organizing from concerned employees, but that this mostly goes unacknowledged in Microsoft’s official vision. Emphasizing future technology while overlooking activism in the present, Adams said, represents a certain way of approaching problems that is typical of technology companies. “If you have spent the last 10 years amassing influence by approaching most problems with technology it’s understandable you see all problems through this lens, particularly if you don’t have to have conversations about power,” he said.

When asked about this concern by the Guardian, Microsoft’s Joppa responded that in the short term, the energy demands of a growing global population will probably still need a mix of renewable and traditional energy sources. By remaining in discourse with these industries, he said, Microsoft hopes to help them change and transition to a better model in the future. “It’s extremely hard to lead if there’s no one there to follow,” he added.

As to whether the technology outlined in their plan will scale, he said there is inherent risk, but this is why they call it a “moonshot”. “When it comes to our plan it’s not like we’ve got it all figured out,” he said. “We’re just trying to do what the science says the whole world needs to do. There’s really no other choice.”

This story is a part of Covering Climate Now’s week of coverage focused on Climate Solutions, to mark the 50th anniversary of Earth Day. The Guardian is the lead partner in Covering Climate Now, a global journalism collaboration committed to strengthening coverage of the climate story.