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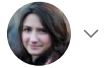
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Our carbon footprint & climate strategy

Context

Earth's climate has changed throughout history. Just in the last 650,000 years there have been seven cycles of glacial advancement and retreat, with the abrupt end of the last Ice Age about 11,700 years ago, marking the beginning of the modern climate era — and of human civilization.

The current warming trend is of particular significance because most of it is extremely likely (greater than 95% probability*) to be the result of human activity since the mid-20th century. The evidence for rapid climate change is compelling: global temperature rise, warming oceans, shrinking ice sheets, rising sea levels… and the list doesn't stop there.

The carbon footprint is currently 60% of humanity's overall ecological footprint and its most rapidly growing component, as it is increasing more than 250 times faster than it did from natural sources after the last ice age. Reducing humanity's carbon footprint is the most essential step we can take to end excess consumption of resources and live within the means of our planet.

> "*We are the first generation to feel the effect of climate change and* **the last generation who can do something about it**" — Barack Obama

The Paris Agreement approved in December 2015 represented a huge historic step in achieving a climate neutral world by the middle of the century. Nearly 200 countries around the globe ag̶~~...~~ ̶erature rise below 2 degrees

👏 7   💬   •••

Celsius, and went even further by agreeing to pursue efforts to limit the increase to 1.5 degrees above pre-industrial levels.

There are no doubts, we all, as individuals, have to participate in this collective effort to reduce the world's carbon emissions. But also, we are convinced that companies can play a crucial role by implementing corporate policies intended to make an impact on global climate change.

At Joko, we are committed to improving our social and environmental impact as a company, aligned with one of our core values: "We Care". We care not only about each other, but also about our planet, our ecology and the world as a whole. Therefore, the carbon footprint assessment was one of the first conscious efforts in this long run of reducing the global temperature rise. The present Climate Strategy is a result of this assessment and internal discussions, aimed to present some key highlights of our actual state and our commitment to reduce our carbon emission through 2026.

What has been done so far

Here is a quick summary of different initiatives that have been implemented so far internally. Please note, that some of those actions weren't necessarily taken for ecological reasons, but rather for convenience or time saving. However, we think it's worth mentioning them here, as they all act as a starting point in our effort to reduce the carbon emission and make a positive impact:

- **Remote work** 🌍 The remote work policy has been generalized at a company level after the first lockdown in early 2020 due to the Covid pandemic. Therefore, each employee is free to work from wherever they want as long as both efficiency and safety are guaranteed. This helps us to reduce a lot of work-home traveling of Joko employees, who are often working from home or from the closest co-working space.

- **Recycling at the office** ♻️ Different bins are available at our Paris office allowing employees to recycle nutritional waste, paper, plastic and glass. A light awareness campaign took place internally to sensitize Joko's employees to this subject.

- **Electronic signature for administrative work** 📜 As all other businesses, we have a lot of legal paperwork: contracts to sign, policies to update. So when we need to get a formal approval by employee (ex. signature), we use a digital tool

like HelloSign to get it done, instead of printing the documents. Moreover, all our documentation is stocked in a digital format, so our printer gets dusty in the office.

- **Refurbished equipment** 🖥 To equip our employees with devices needed for their work, we used to provide them with refurbished equipment bought on Back Market. Thus, we participate in a collective effort of recycling devices instead of constantly producing new ones.

Some warnings

Yes, nothing is perfect. So, before you dive deeper into our carbon footprint assessment and the Climate Strategy, we would like to highlight some limitations of the analysis. You can find them below:

- **Server emissions** 🧐

By default, Joko does not directly produce many emissions as we don't have heavy industrial processes, and we're not producing or transporting anything. However, we do process millions of bank transactions and related data. And of course, this processing requires a lot of energy and the constant work of our data servers, primarily hosted by Amazon Web Services (AWS). We're conscious that this has a non-negligible impact on our carbon footprint as a company, however Amazon does not provide any information about energy usage on an individual account basis, despite our efforts to communicate with them about this.

Attempting to estimate our AWS carbon emissions ourselves is a near impossible task, as there is no reliable way to perform this analysis. Costs are typically not a good proxy for emissions as they do not directly relate to computing energy, and there are too many additional factors like storage, duplication of data, networking and cooling that make any estimate way too rough to be useful. Many have tried to create tools that help calculate these outputs, but it is a notoriously difficult subject, and not just one we struggle with.

Amazon does communicate about their carbon reduction efforts at large. Specifically, they have a goal of powering all their cloud operations with 100% renewable energy by 2025. And in their Ireland data center, which we use primarily, AWS purchases energy credits to offset any non-renewable energy that's currently used.

So while our server emissions are not included in the carbon footprint below, it's worth mentioning that we are deeply conscious of this limitation. And in terms of reduction efforts, besides just relying on the service provider to convert to renewable energy, we are also financially incentivized to ensure we have the most efficient operations so we don't use more computing resources than needed. While we don't want to reduce the amount of data we're processing, making internal operations more efficient will help us to have a positive impact on our carbon footprint as well.

- **Who said "digital"?** 🤨

The digital transformation has brought many benefits that also have a positive impact on the fight against climate change and reduce CO_2 emissions. However, as we alluded to above when discussing AWS, the production, use and data transfer of digital devices (broadly referred to as "Information and communication technologies" or "ICT") causes more CO_2 emissions than one might expect.

According to The Shift Project's report, *Lean ICT : Towards Digital Sobriety,* "the fast expansion of ICT leads to a rapid increase of its direct energy footprint. This footprint includes the energy used for the production and the use of ICT equipment (servers, networks, terminals). This direct footprint has been increasing by 9% per year. Compared to 2010 the direct energy consumption generated by 1 euro invested in digital technologies has increased by 37%. {…} The explosion of video uses (Skype, streaming, etc.) and the increased consumption of frequently renewed digital equipment are the main drivers of this inflation."

There is no doubt, it is critical to recover our individual and collective abilities to challenge the social and economic benefits of both our purchasing and consumption behaviors of digital objects and services. Companies have a key role to play, and much to gain — notably the long term continuation of their digital transformation, and the limitation of costs that can otherwise run amok. At Joko, we wanted to take a first step towards including our digital carbon footprint in this analysis by focusing on email management. However, we assume that it's far from being a complete overview of our digital impact, and this is something we would like to deepen in the next analysis.

- **Rough estimations** 🤭

We are not going to hide, some elements of our analysis are based on rough estimations. This is the case, for example, of rubbish at the office or emission of email sending and storage. We took these estimates out of recent public studies (sources are specified), as it was difficult at the moment of analysis, if not impossible, to accurately define our own numbers. We agree that this is not ideal to make in order to make a perfect assessment, however we found it important to include those estimations as a first starting point. Thus, these numbers are intended to be challenged and thorough during the next analysis.

Our carbon footprint today

How we did this

We worked with an organization named WeCount that helped us categorize each part of our carbon emissions. Through a series of workshops, they provided advice and feedback on our progress in compiling this report.

The methodology used to compute each category of carbon emission is included on an individual basis in a table in the section below. On a higher level, we should note that calculations were done with the intention of 2021 as the base year. Given that the company has only been around for 3 years, and both 2021 and 2020 were atypical years, then many of the outputs are estimates with certain assumptions built in. A level of uncertainty was assigned in all cases, and we have noted below in categories where the uncertainty is higher than baseline.

The footprint

Our current carbon output today is ~**24 tCO$_2$e** (tonnes of carbon dioxide equivalent) on an annualized basis. "Carbon dioxide equivalent" is a standard unit for counting greenhouse gas emissions regardless of whether they're from carbon dioxide or another gas, such as methane. To put it in context, 24 tCO$_2$e is approximately equivalent to driving a standard gas car for 98,000 km.

Carbon emissions by category

Aa Category	# Output in tCO₂e	☰ Methodology	☰ Notes
🛬 Business travel	1.81	Analysis of actual travel for offsite, and any actual business travel (very minimal). Assumption of 2 offsites per year.	
🚌 Travel between work and home	0.23	Employee survey	Most employees either work remotely (and thus no have no travel 99% of the time). For those within Paris, most take public transportation or bike to go to the office, both of which are low carbon emmiters.
🖥 Office construction/renovation	1.01	Amortized number, based on the fact that it's an office of 156 m² in an old building that was renovated in the past 30 years.	
⚡ Office energy use	0.85	Extrapolated from actual electricity usage in the first half of 2021, and actual gas usage in 2020	Medium level of uncertainty here, due to the various lockdowns.
💻 Tech hardware	4.36	Purchases of computers, external monitors, printer/scanner, amortized over a period of 3 to 5 years	
🍕 Nutrition	12.07	Employee survey	Includes all lunches eaten by employees during the course of the workweek.
📧 Email use	3.8	136 kg of CO2 per person for the sending/receiving and storing of emails per year	High level of uncertainty, as it depends very much on the types of emails, attachments, work styles, etc. Worth noting that spam emails, although higher in volume, have a lower carbon impact as they they are typically detected and quickly deleted.
🗑 Trash waste	0.23	Calculated estimate based on the finding that an average French person produces 354kg of trash a year, and that 20% of their trash would be produced while at the office, for those that are in the office.	High level of uncertainty on this number. Final output is based on the average breakdown of how waste is processed in France (meaning how much is recycled, composted, etc).

The same information as in the table above, but visualized as a pie chart. Screenshot from WeCount's web app.
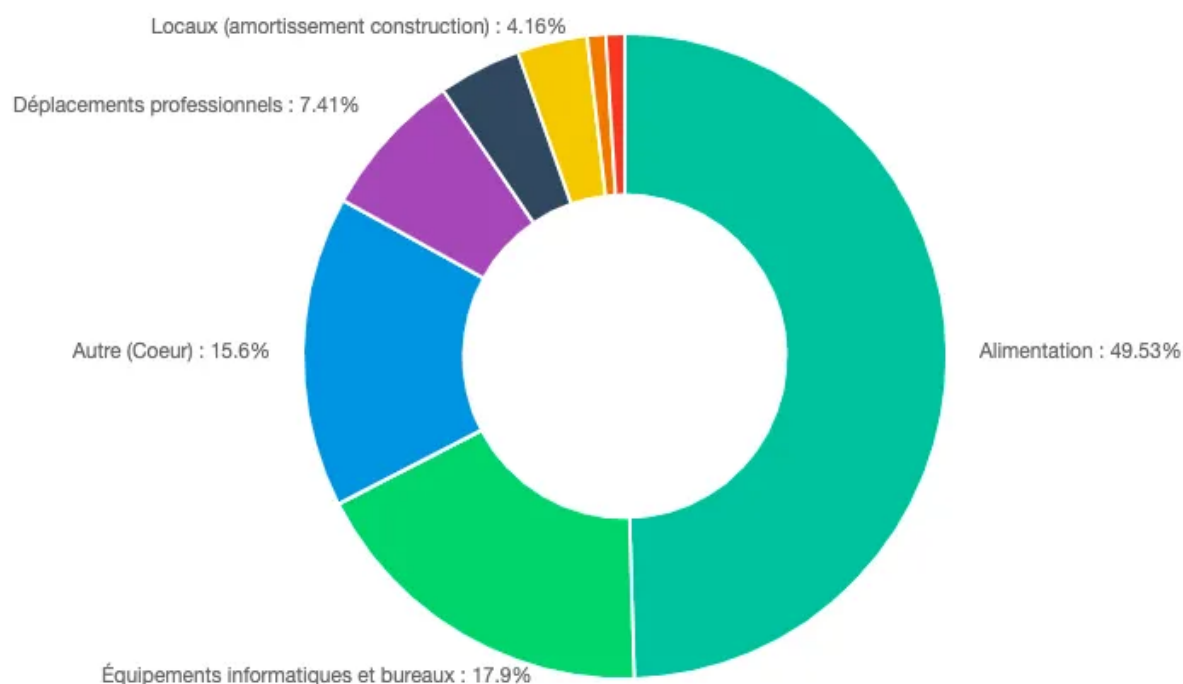
Focus on highest outputs

Nutrition: 12.07 tCO₂e

To many people's surprise, food production and agriculture are responsible for a quarter of the world's greenhouse gas emissions.

Global greenhouse gas emissions from food production

Our World in Data

Global Emissions
52.3 billion tonnes of carbon dioxide equivalents

Non-food: 74%

Food: 26%

Retail: 3% of food emissions
Packaging: 5% of food emissions
Transport: 6% of food emissions
Food processing: 4% of food emissions
Wild catch fisheries (1%)

Supply chain 18%

Livestock & fish farms
30% of food emissions

Livestock and fisheries 31%
Methane from cattle's digestion ("enteric fermentation")
Emissions from manure management
Emissions from pasture management
Fuel use from fisheries

Crops for animal feed
6% of food emissions

Crops for human food
21% of food emissions

Crop production 27%

Land use for human food
8% of food emissions

Land use for livestock
16% of food emissions

Land Use 24%
Land use change: 18%
Cultivated organic soils: 4%
Savannah burning: 2%

Data source: Joseph Poore & Thomas Nemecek (2018). Reducing food's environmental impacts through producers and consumers. Published in *Science*.
OurWorldinData.org – Research and data to make progress against the world's largest problems.   Licensed under CC-BY by the author Hannah Ritchie.

Source

The categories of food that result in the highest carbon output are typically sourced from animals. Broadly speaking this means meat and dairy. Beef, lamb and cheese sit right at the top of the list as the highest emitters of carbon into the atmosphere.

Beef in particular has an outsized impact, due to its methane production and the land use required for feed (forests are cut down to plant soy and corn to feed cows).

Simply cutting beef out of one's diet and replacing it with pork and poultry can significantly reduce carbon impact.
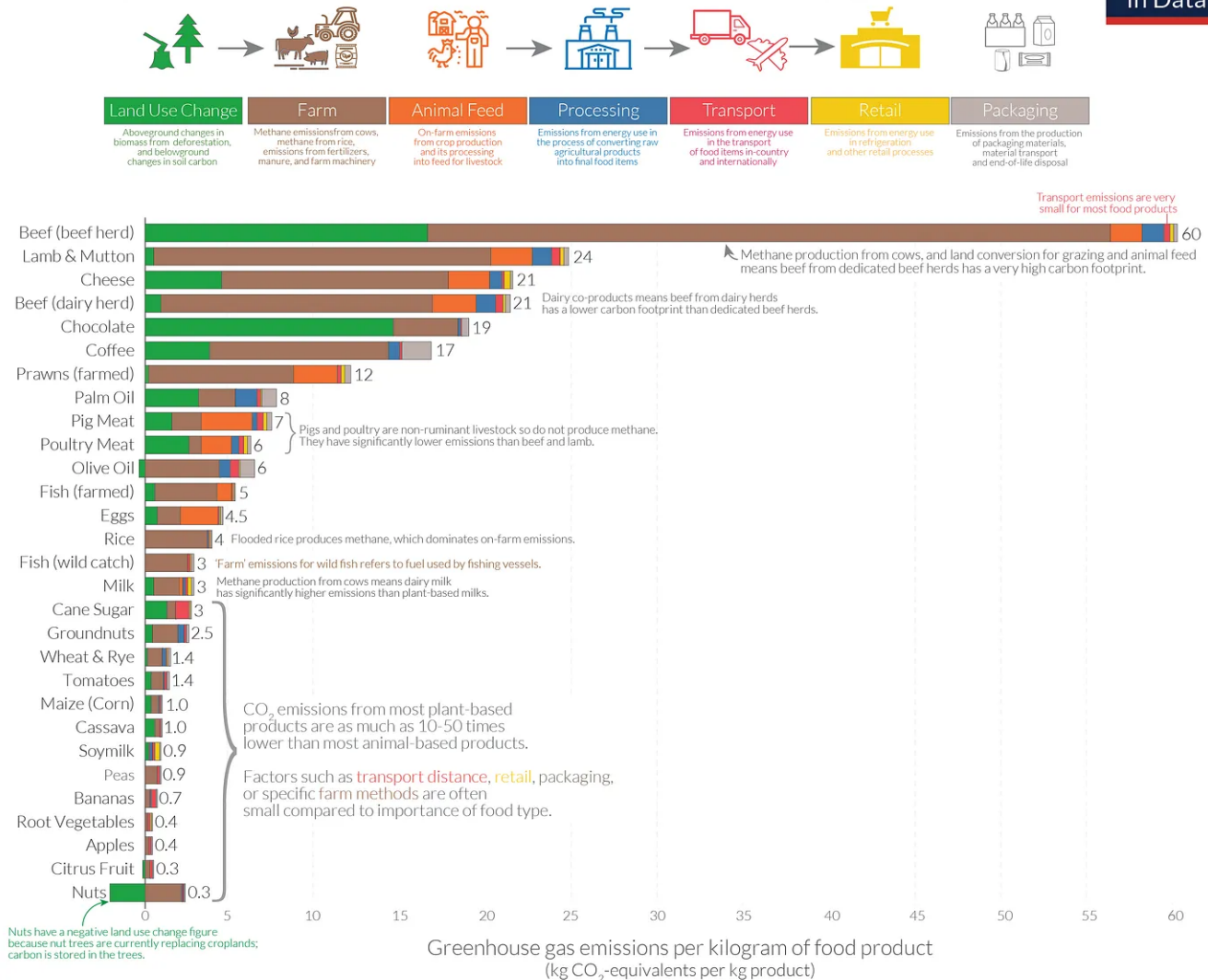
Additionally, as the image below notes, "CO_2 emissions from most plant based products are as much as 10–50 times lower than most animal-based products."

Food: greenhouse gas emissions across the supply chain

Our World in Data

Land Use Change	Farm	Animal Feed	Processing	Transport	Retail	Packaging
Aboveground changes in biomass from deforestation, and belowground changes in soil carbon	Methane emissions from cows, methane from rice, emissions from fertilizers, manure, and farm machinery	On-farm emissions from crop production and its processing into feed for livestock	Emissions from energy use in the process of converting raw agricultural products into final food items	Emissions from energy use in the transport of food items in-country and internationally	Emissions from energy use in refrigeration and other retail processes	Emissions from the production of packaging materials, material transport and end-of-life disposal

Transport emissions are very small for most food products

Food	Emissions (kg CO₂-eq per kg)
Beef (beef herd)	60
Lamb & Mutton	24
Cheese	21
Beef (dairy herd)	21
Chocolate	19
Coffee	17
Prawns (farmed)	12
Palm Oil	8
Pig Meat	7
Poultry Meat	6
Olive Oil	6
Fish (farmed)	5
Eggs	4.5
Rice	4
Fish (wild catch)	3
Milk	3
Cane Sugar	3
Groundnuts	2.5
Wheat & Rye	1.4
Tomatoes	1.4
Maize (Corn)	1.0
Cassava	1.0
Soymilk	0.9
Peas	0.9
Bananas	0.7
Root Vegetables	0.4
Apples	0.4
Citrus Fruit	0.3
Nuts	0.3

Methane production from cows, and land conversion for grazing and animal feed means beef from dedicated beef herds has a very high carbon footprint.

Dairy co-products means beef from dairy herds has a lower carbon footprint than dedicated beef herds.

Pigs and poultry are non-ruminant livestock so do not produce methane. They have significantly lower emissions than beef and lamb.

Flooded rice produces methane, which dominates on-farm emissions.

'Farm' emissions for wild fish refers to fuel used by fishing vessels.

Methane production from cows means dairy milk has significantly higher emissions than plant-based milks.

CO_2 emissions from most plant-based products are as much as 10-50 times lower than most animal-based products.

Factors such as transport distance, retail, packaging, or specific farm methods are often small compared to importance of food type.

Nuts have a negative land use change figure because nut trees are currently replacing croplands; carbon is stored in the trees.

Greenhouse gas emissions per kilogram of food product
(kg CO_2-equivalents per kg product)

Note: Greenhouse gas emissions are given as global average values based on data across 38,700 commercially viable farms in 119 countries.
Data source: Poore and Nemecek (2018). Reducing food's environmental impacts through producers and consumers. *Science*. Images sourced from the Noun Project.
OurWorldinData.org – Research and data to make progress against the world's largest problems.   Licensed under CC-BY by the author Hannah Ritchie.

Source

Based on the survey we conducted at Joko, most employees are meat-eaters. On average they eat beef, veal or lamb during 1 lunch per workweek, but chicken, pork or cheese are eating during 2.5 lunches per workweek. Only 1.5 lunches per workweek are vegetarian (not vegan), with some employees not eating any vegetarian meals at all.

This relatively high ratio of meat-to-vegetarian meals results in nutrition being the highest contributor to our carbon footprint, and also presents the largest opportunity for improvement.

Tech hardware: 4.36 tCO$_2$e

The high emissions here arises from the manufacturing of hardware we use for work, rather than the energy usage of that hardware. Lots of industry-wide effort has been put into optimizing the electricity consumption of modern devices, but less so in the actual creation of those devices, so it remains significant.

Today's computers and mobile devices are full of intricately processed components that require a lot of energy to product. One article notes that "the carbon dioxide emissions resulting from energy consumed in the manufacture of a laptop computer can in some cases come close to or equal the emissions resulting from the manufacture of a refrigerator".

These products also use lots of limited natural resources like aluminum, cobalt, copper, glass, gold, tin, lithium and zinc — all of which require energy to be extracted and processed (and this extraction has separate societal and environmental drawbacks).

At Joko, every employee gets a computer, and the company has bought some extras as well, for a total of 37. An additional 25 external monitors have been purchased, which contribute to the total carbon output. The output is calculated on an annualized number based on a 3 year amortization schedule for these devices.

Our Climate Strategy

Objectives

Measuring our carbon footprint was a first step to address the climate challenges we are all facing today. At Joko we want to "set the bar high" regarding our environmental impact just as we do in our work.

Even if we tried to be as precise and exhaustive as possible in our assessment, we are conscious of the methodological limitations detailed in the "Warning" part of this report further above. But in the end, what matters most is the progress we are going to make and our plan to decrease our current carbon footprint.
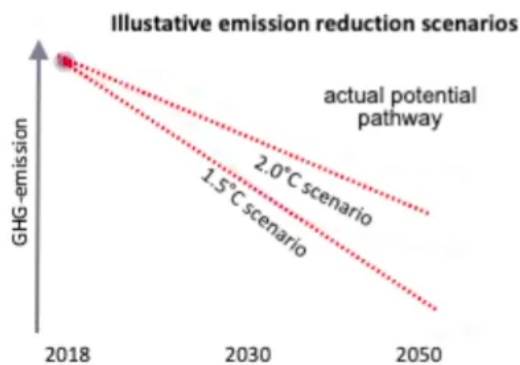
To quantify our objectives, we first defined our reduction target. It could go from limiting global temperature rise from 1.5° to "well below 2°". In an effort to be ambitious, we decided to build an action plan consistent with an objective of "well below 2°". Our target is consistent with The Paris Agreement set in 2015 which has this exact goal.

According to Science Based Targets, we must reduce our carbon emissions by 2.5% per year to achieve this goal. It is approximatively equivalent to reducing it by 12.5% over 5 years (by 2026).

As a start-up, we must anticipate how we will measure the evolution of our carbon emission since it will be impacted in parallel by our growth. We could decide to measure our carbon emissions per (i) headcount or (ii) revenue unit. We selected the first option since the main part of our emissions are related to individual behavior (e.g., nutrition, transport). At the time this report is being written at the end of July 2021, the total number of employees is 25 (founders included) which is equivalent to a carbon footprint of 0.96 tCO_2e per employee.

Actions to reach the objectives

We have identified specific actions for most of the categories that represent Joko's carbon emissions. The "Priority view" lists items based a priority score calculated through a combination of the Difficulty and Impact fields. You'll note that the

actions related to "Nutrition" and "Tech hardware", our two highest carbon output categories, sit at the top of the table.

A couple of the categories below (in particular "Travel between work and home" and "Office construction/renovation") do not have actions outlined because they represent a relatively low level of carbon emissions, and we have little room for improvement in those areas.

It is now the scope of a subsequent squad (or rather multiple squads) to discuss these actions and apply them.

Carbon reduction actions

Aa Action	☰ Category	◷ Target	⊙ Difficulty	⊙ Impact	Σ Priority score
🟫 Offer options for introducing more vegetarian meals into employee's lives	📣 Nutrition	Q4 2021	Low	Medium	4
ℹ️ Make the team aware of the impact of animal-based foods	📣 Nutrition	Q4 2021	Low	Medium	4
📱 Formalise a policy for refurbishing and recycling of electronic devices	💻 Tech hardware	Q2 2022	Low	Medium	4
📊 Create a Purchase Charter	💻 Tech hardware	Q1 2022	Low	Medium	4
📧 Conduct internal awareness campaign "Écogestes numériques"	✉️ Email use	Q4 2021	Low	Medium	4
🔝 Prioritize non-animal based foods during offsites	📣 Nutrition	Q1 2022	Low	Low	3
💡 Organize a brainstorm session to define "Ecogestes"	⚡ Office energy use	Q1 2022	Medium	Medium	3
✈️ Make team members aware of the emissions related to business travels	✈️ Business travel	Q4 2021	Low	Low	3
🗑️ Improve recycling efficiency in the office	🗑️ Trash waste	Q1 2022	Low	Low	3
📈 Create a tool to assess the carbon impact of company events	✈️ Business travel	Q1 2022	High	Low	1

A note on the determination of impact in the table above: Impact is lower if it doesn't directly result in decreased carbon usage (ex: spreading knowledge by itself doesn't reduce carbon emissions) and/or if it is part of a category that doesn't contribute a lot to Joko's carbon output. And conversely, impact is higher if doing the action directly reduces the carbon emissions and/or if it's part of a high emission group.

What about carbon neutrality?

Companies can purchase so-called carbon credits for funding carbon sequestration projects like tree planting as an effort to achieve carbon neutrality. Purchasing such credits is meant to offset the carbon outputs and achieve an arithmetic balance between the calculated carbon emissions and the amount of carbon reduced in the atmosphere.

There are several issues with this approach, including the fact that tree planting (the most common carbon sequestration method) is fraught with issues such as a multi-decade timeframe for the actual sequestration, the fact that trees are usually not planted in the same region as where the carbon is emitted, and systemic failures like trees that are cut down after being planted. Offsets also tend to be an excuse for companies to continue with current carbon outputs, by offering the appearance that they are doing something without actually changing underlying behaviors.

In the end, most experts say that purchasing such offsets are better than doing nothing but they conclude by saying that offsets "are only an acceptable tool once companies have done everything they can to pollute less". Thus carbon offsets may be a solution for Joko in the future once the top actions above are taken, but at the moment purchasing offsets would be a passive and ineffective approach to tackling this issue.