shopify

Shopify's Sustainability Fund

2022

Buying Carbon Removal, Explained

A carbon removal buying guide by Shopify

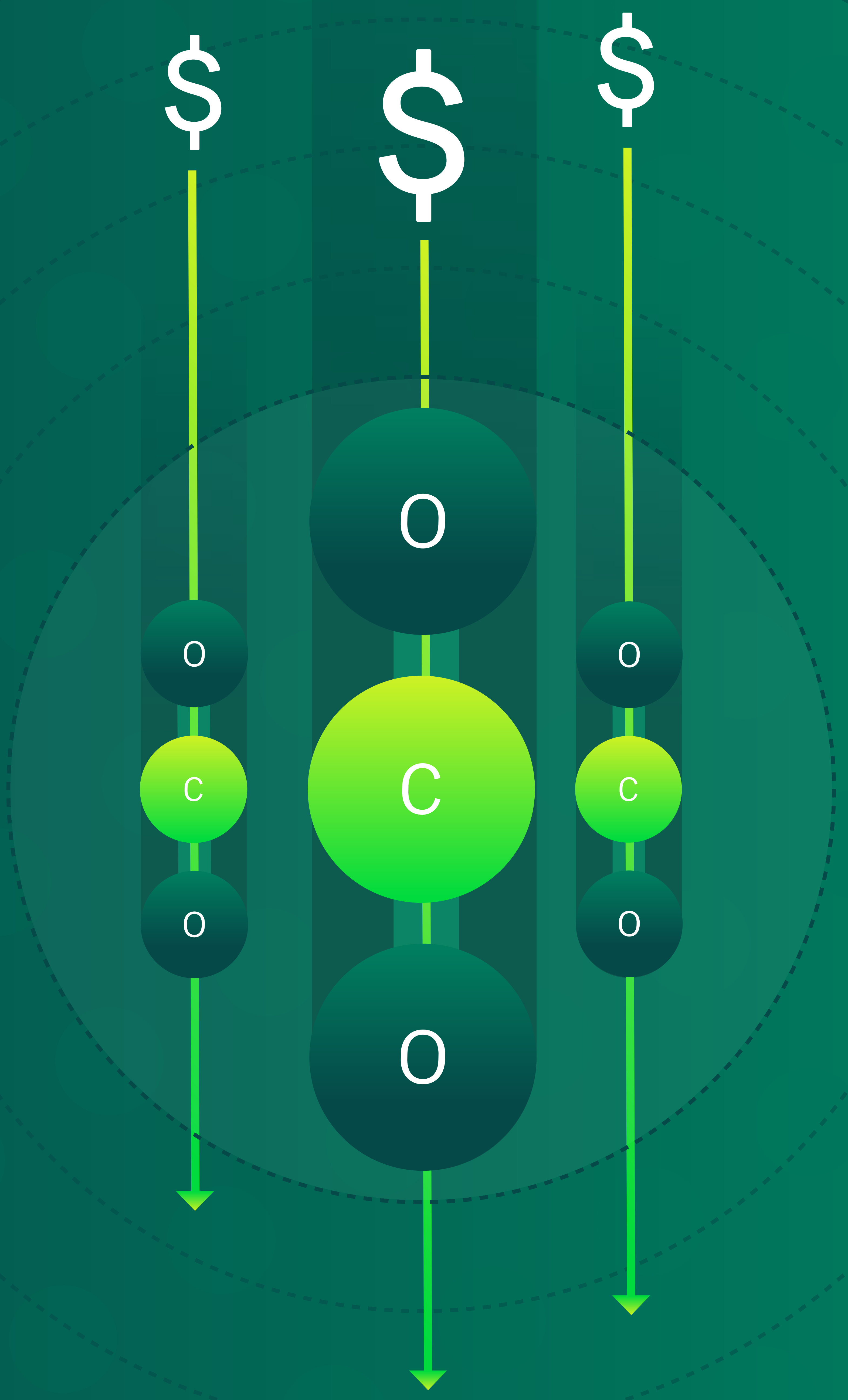
Introduction

Buying carbon removal—you've watched other companies do it, learned why it's critical in the fight against climate change, and read about the game-changing technologies getting built. You're convinced your company should get involved, but what's next?

This guide is meant to simplify your company's journey, from having to get buy-in from internal stakeholders, to constructing your portfolio, all the way up to retiring the credits you receive. It's been developed based on Shopify's learnings since we started buying carbon removal through our Sustainability Fund back in 2020.

Buying carbon removal doesn't have to be complex or time-consuming. It's not just for companies with large sustainability teams and budgets. It's not for certain sectors of the economy. We truly believe any business, of any size, in any industry can and should get involved. And that's important because it's going to take all of us to accelerate this industry.

Get in touch with our team at Shopify with questions.



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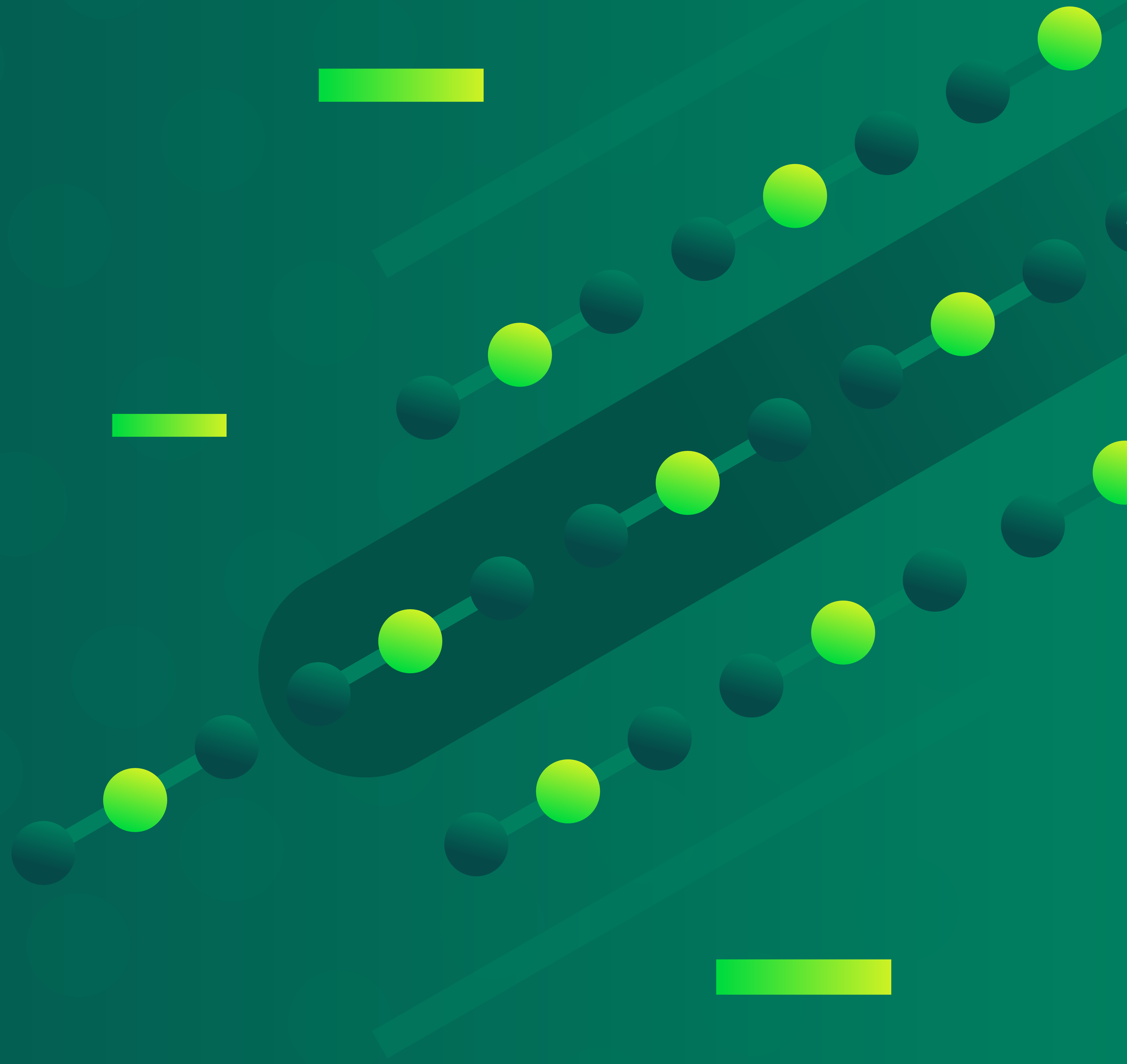

Carbon removal primer

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Carbon removal primer

Carbon Offset

Avoided emissions credits, commonly referred to as offsets, are not the same as carbon removal credits. When you buy an **offset**, you pay someone else to not emit carbon dioxide (CO_2). If you've emitted one tonne of CO_2 and bought one tonne of offsets, less CO_2 is getting released, but your one tonne is still up in the atmosphere, and will stay up there for a long time.

While offsets carry a climate benefit in theory, the majority are generated from **questionable projects**. There are certainly some impactful offsets to purchase, such as paying someone to capture CO_2 before it's released by a factory and safely injecting it deep underground, but we need to go beyond offsetting because there is already too much carbon in the air.

Carbon Removal

When you buy a **carbon removal credit**, you pay someone to pull carbon dioxide out of the atmosphere and to store it outside of the atmosphere on your behalf. If you've emitted one tonne of CO_2 and you've bought one tonne of carbon removal, you've broken even because the equivalent amount to your one tonne of CO_2 has been pulled back out of the atmosphere.

Not all carbon removal credits are equivalent, with one difference being **durability**, which reflects the planned length of time CO_2 will be stored and the risk it's re-released. Nature-based solutions, like reforestation and soil-carbon storage are typically less durable, while engineered solutions like direct air capture, and hybrid solutions like biomass conversion and sequestration, have the ability to store CO_2 more durably. This guide is focused on projects with higher durabilities because they are still in their infancy and desperately need our support to scale up.

Carbon Reduction

Buying a carbon removal credit is not the same as reducing emissions. **Reducing emissions** means you aren't emitting CO_2 in the first place, so there's no need to remove the equivalent amount from the atmosphere. The simplest example is sourcing energy from a renewable source instead of a fossil source. Reducing emissions is no doubt the most important piece of the puzzle, however, because there's already too much carbon in the air, reducing CO_2 and removing it must go hand in hand to reverse climate change.

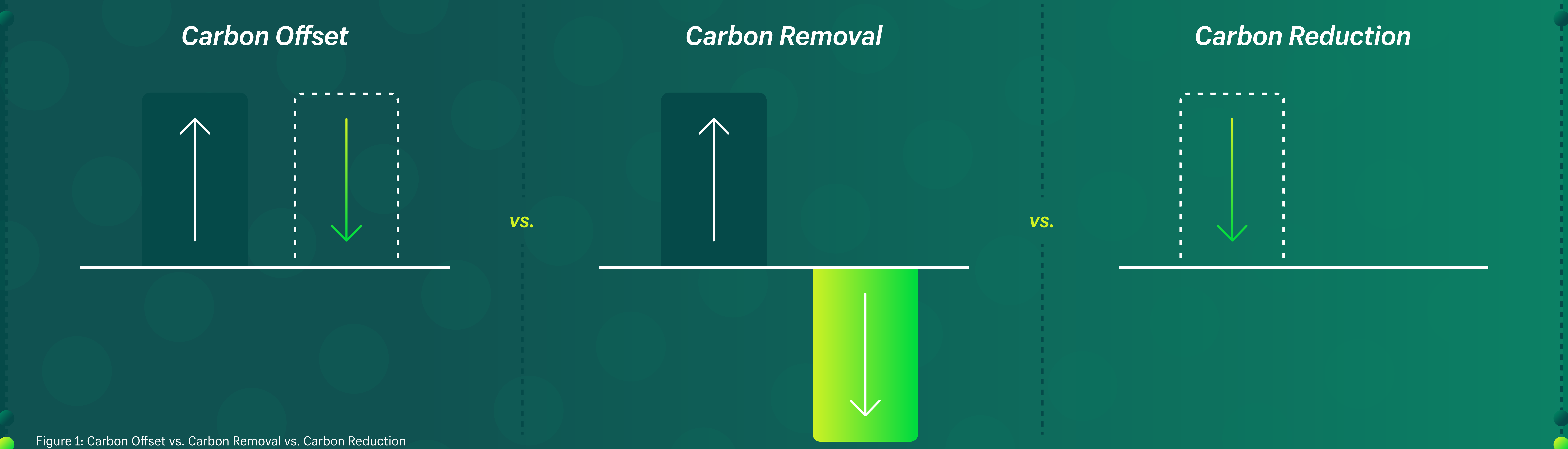

Figure 1: Carbon Offset vs. Carbon Removal vs. Carbon Reduction

Before making a purchase

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The business case for buying carbon removal now

It can be challenging to convince decision makers in your organization to pay hundreds of dollars per tonne for carbon removal credits when some offsets can be bought for a few dollars per tonne. In addition, supporting an unproven technology or early-stage supplier can also carry a perceived level of risk. However, **there are plenty of reasons you can provide a decision maker, depending on what motivates them**.

If they care about mitigating risk for the business, use the following:

- **Avoid the reputational risk from buying offsets:** If you buy low-quality offsets or those with a high risk of reversal, there's a chance your company could suffer reputational damage from greenwashing.
- **Creating future supply of carbon removal:** If your business has ambitions to reach net-zero emissions, according to the Science Based Targets Initiative (SBTi) you need to use permanent carbon–removal credits after you've reduced emissions as much as you can. Future compliance programs could also require it. But unless you send a demand signal as a buyer now, carbon removal solutions won't get to the scale and price you'll need to reach your targets, or to be compliant.
- **Lock in supply:** As more buyers enter the market, any quantities available over the next decade will get bought up quickly. If you think you'll need carbon removal credits in the future for a voluntary commitment or compliance program, your best bet is to lock in quantities now.
- **Gain access to preferred pricing:** When you enter into a long-term contract for carbon removal, you can secure controlled prices throughout your agreement. If supply stays low and demand continues to rise, these prices could turn into a bargain. If you're buying large volumes, you might even be able to secure access to the lowest available price in the future if it's less than your contracted price.

If they want to make a difference in the fight against climate change, use the following:

- **Your business can help reverse climate change:** The Intergovernmental Panel on Climate Change (IPCC) acknowledges carbon removal is necessary to stay below 1.5 degrees warming, in addition to deep emissions reductions. But less than 10,000 tonnes of CO_2 has been permanently removed to date, and we need to reach multiple billion tonnes of removal every year by the year 2050. Your organization has a chance to help accelerate high-potential carbon removal solutions that will truly make a difference.

If they want a reputational benefit, use the following:

- **Your company can be seen as a climate leader:** When you buy carbon removal, you'll have a chance to show up as a corporate climate leader. We've seen this first-hand at Shopify. From press coverage to high-impact partnership opportunities to resonating with current and future employees and customers, there is real value in placing educated bets in this rapidly growing space.

Balancing a net-zero target and carbon removal

Companies with a net-zero target through **SBTI** must drastically reduce emissions between now and their target date, but are not required to buy carbon removal until their target date hits. This is a significant gap in requirements—buying carbon removal now helps suppliers scale and reduce costs, and is the only way to ensure enough credits are available at a low enough price to reach net zero when a target date arrives. **Companies with a net-zero target must recognize this gap, and also prioritize carbon removal along the way.** Companies without a net-zero target should assess whether they're a good candidate before setting one, given the administrative effort.

What is a net-zero target?

> Setting a net-zero target with SBTI means picking a date that your company will be done adding emissions to the atmosphere on a net basis. By the time your target date rolls around, you're required to have reduced emissions across your entire value chain by at least 90% compared to your baseline year, and must remove any remaining emissions with permanent carbon removal.

Ideal candidates for a net-zero target

A net-zero target can be extremely valuable for companies in carbon-intensive sectors, with many reduction levers to pull. Take a concrete company which can adopt new technologies to reduce cement content, its primary driver of CO_2 emissions, or an airline which can power its planes using sustainable aviation fuel instead of fossil jet fuel. A net-zero target can be a critical tool to get leadership alignment and commitment to pull these reduction levers.

When a net-zero target makes less sense

Companies in less carbon-intensive industries with fewer direct reduction levers are largely dependent on the greening of the power grid and supply chain decarbonization to reach net zero. Large companies can enter into virtual power purchase agreements or place pressure on suppliers to help speed this up, but overall there is less to do. Setting a net-zero target might not be worth the accounting and reporting effort, and resources can instead be directed toward scaling carbon removal. This is the path we're taking at Shopify.

Selecting your company's carbon removal criteria

Once you've got approval to buy credits, but before you go out into the market to explore options, it's critical to decide what your company cares about. Because of the sheer volume of options you'll find, many of which you'll want to avoid, knowing your criteria upfront will help save time and lead to better decisions. **There is a list of widely-accepted, non-negotiable criteria that every buyer should adopt when selecting suppliers to buy from.** After you've ticked these boxes, you may choose to layer in extra criteria depending on your company's preferences.

Non-negotiable criteria

- **Net negativity:** The solution must capture and store more atmospheric CO_2 than it releases over its lifecycle. While a solution's net negativity may be small in the beginning, you should expect the margin to grow as the solution matures.
- **Verifiability:** The company must be able to quantify how much CO_2 has been captured and stored. Early-stage suppliers should be developing quantification methods and established suppliers should have these methods already in place.
- **Additionality:** The carbon removal wouldn't occur if you didn't make this purchase.
- **Safety and environmental justice:** The supplier must be taking steps to mitigate negative externalities, while deploying its technology in a way that is fair and just. This could mean limiting land and fresh water use, and having environmental and economic benefits on local communities where the supplier operates.

Critical for consideration

- **Cost:** The solution must have potential to reach a low cost at scale to be economical for all buyers, even price-sensitive ones. More buyers means more carbon gets removed. Solutions that can get close to or below $100/tonne at scale should be prioritized.
- **Durability:** The longer a solution can store CO_2 out of the atmosphere, the better. With solutions that store CO_2 for less than 100 years, progress can be undone before we've slowed down climate change.
- **Capacity:** The solution must be able to reach a massive scale. We need to be pulling billions of tonnes of CO_2 out of the atmosphere annually by 2050, and solutions with the potential to do a big chunk of this should be prioritized.

> Applying this criteria means reviewing publicly available information on a company, or asking a company directly. If you don't have the time or expertise to collect data to determine whether a carbon removal company meets the above, non-negotiable and critical criteria, look to purchases made by other buyers that share these same criteria, such as **ourselves** and **Frontier**.

Extra criteria

You may have identified extra criteria to apply to your purchases; perhaps you're enamored by high-tech solutions like **Heirloom**, or prefer solutions with a natural element like **Loam**. Maybe you're a mining company, and want to support a mineralization solution like **Carbin Minerals**; maybe you're a Canadian-based company and want to support a Canadian-based supplier like **Carbon Engineering**. While you shouldn't let these extra criteria get in the way of the non-negotiables, applying extra criteria can be powerful for getting internal buy-in.

Making a purchase

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Constructing a carbon removal portfolio

Once you have your criteria, it's time to choose the suppliers you want to buy from. Unless you're only interested in purchasing from one supplier, you should take a portfolio approach to your purchases. A portfolio approach lets you support innovation, while protecting you against any delays in the supplier delivering credits to you. This can be broken down into three steps:

1 Pick the broad categories of carbon removal you want to support

Purchase from suppliers in a few different carbon removal verticals, whether it's **direct air capture**, **mineralization**, **ocean-based removal**, **biomass conversion and sequestration**, or **others**. It's unlikely one vertical will be able to achieve multiple gigatonnes of carbon removal on its own, so try to split your budget across a few of them.

2 When possible, choose multiple technologies within each category

If you're planning to support multiple suppliers in the same vertical, try buying from suppliers pursuing different technology types. Within ocean-based solutions this could mean purchasing from a company perfecting ocean alkalinity enhancement, like **Planetary**, while also buying from **Running Tide**, which is taking a multi-pathway approach.

3 Choose the right mix of suppliers based on your risk level

- **High risk:** If you want to support innovation, skew your portfolio towards early-stage suppliers with transformational ideas, maybe 80% of total spend.
- **Medium risk:** If you want to support innovation but also want to make safer bets, purchase from a mix of early-stage and more established suppliers, closer to 50% of total spend for each.
- **Low risk:** If your leadership team is not comfortable supporting moonshot ideas, or you have a specific credit need to fill, support technologies closer to commercialization. Assuming some risk may be your only near-term option given how early the market is.

General principles for minimizing the risk of your credits not getting delivered

A → B → C

A: Sign more agreements. The more you sign, the greater the chances you've purchased from multiple successful suppliers. A good number might be three or more.

B: Skew purchases towards technologies closer to commercialization. Make fewer purchases from early-stage suppliers, or sign smaller deals with those early suppliers.

C: Skew your purchases towards suppliers with a thoughtful and rigorous approach to quantifying credits.

Best places to buy credits

Some suppliers provide multiple places to purchase their credits. Your choice as a buyer should be based on how much you're looking to buy. **For medium to large purchases (total contract value of $10K+), the most impactful route is contracting directly with the supplier**, either on your own or with the support of an expert-led buying group like Frontier. You'll have the opportunity to meet the supplier, understand what you're buying, get contract terms that are right for both parties, and avoid transaction fees. For small purchases (total contract value of <$10K), buying through a supplier's website or a marketplace can be a solid option.

Medium-large purchases

- **Sign a purchase agreement directly with a supplier:** You can find contact details on supplier websites. For early-stage suppliers, you'll likely negotiate directly with founders, versus sales teams for suppliers that are further along. Consultants like Carbon Direct can help if you want to do it yourself, but need a bit of support.
- **Work with an expert-led buying group, like Frontier:** Frontier is an advance market commitment to purchase $1B of carbon removal by 2030, made by ourselves, Stripe, Alphabet, Meta, and McKinsey Sustainability. Frontier is a great option for companies with large sustainability budgets that want to maximize impact, but minimize work and risk. Their experts take a portfolio approach to project selection, conduct extensive due diligence, and support buyers in contract negotiations. Other expert-led buying groups are popping up and may be a better fit, depending on your budget. Contact Frontier if you're interested in getting involved as a buyer.

Small purchases

- **Buy on a supplier's website:** A few suppliers have places on their websites to buy. Some suppliers, like CarbonBuilt, allow for one-off credit purchases, while others like CarbonCure and Charm offer monthly subscription plans. Climeworks has both options. Monthly subscription plans are trickier because if you want to buy a specific volume, you may need to subscribe and then cancel once you've received credits.
- **Buy through a marketplace:** Marketplaces aggregate credits from multiple sources and resell them. While buying through a marketplace can save you the time it takes to identify a company and negotiate a purchase, you should be mindful of their due diligence process and whether they're being a good partner to the company. Some marketplaces compromise on quality to have cheap credits as part of their offering, while others charge high fees to suppliers to have their credits listed, so it's important to do your homework.

Figure 2: Medium-large credit purchases & small credit purchases

Impactful commercial agreement clauses and terms

When you purchase directly from a supplier, you'll be negotiating and signing a carbon removal purchase agreement. To maximize your support, your agreement should include three commercial elements: **(1) it should be for multiple years, (2) it should include an upfront payment, and (3) the credit pricing should cover the supplier's entire cost** to complete the carbon removal. This structure helps suppliers meet the needs of investors, who will typically only finance a project with a strong revenue stream for a large portion of the facility's lifetime.

The commercial structure we use at Shopify includes the following clauses:

- **Breakdown of project milestones:** Depending on the stage the supplier is at, this could include things like R&D and construction milestones, or could simply be credit delivery milestones. This gives buyers upfront context into a supplier's scale-up plans, and allows you to understand when a project is on or off track.
- **Total amount of carbon removal credits:** Specify the total amount of carbon removal credits you are purchasing under the agreement.
- **Pricing for each batch of credits:** As technologies mature, costs should decrease, so your agreement should reflect this. Credits in the latter years should be less expensive to provide an incentive for suppliers to bring costs down.
- **Payment schedule:** For early-stage suppliers, consider tying payments to pre-delivery project milestones (up to 50% of contract value) to help fund R&D and construction. The percentage paid upfront should be less for suppliers closer to commercialization and close to 0% for suppliers already operating their first large-scale facility.

In addition to the above structure, here are some other things to think about when putting together the commercial elements of a carbon removal purchase agreement:

Documentation/verification

If you expect to receive third-party registry-issued credits, specifically outline this in the agreement. If you're planning to accept credits quantified by a supplier against their in-house methodology, include language stating that the methodology must undergo an independent expert review, that credits must be delivered with sufficient documentation to allow you to validate them, and that credits must undergo a third-party audit. You should also build in the flexibility to have your credits quantified against a different methodology if it becomes available in the future.

Delivery

Early-stage companies developing novel technologies can get behind on credit deliveries as they iterate and face go-to-market challenges. In your agreement, you should be explicit when you expect each batch of credits to be delivered, as well as what should happen in the event of a delivery delay, including timelines for receiving notice and delivery extensions. The agreement should also note that credit delivery confirms a transfer of ownership to avoid double counting.

> ***Reference these*** *sample commercial clauses and terms as you review supplier agreements, or build out your own agreement template.*

Getting comfortable with credits not issued by a third-party registry

Buyers should be willing to accept credits quantified by suppliers using in-house methodologies, as long as the supplier is following the few critical requirements outlined in detail below. Providing this flexibility might single-handedly be the most impactful decision you can make as a buyer. Buyers can benefit too—credits can have even greater validity, while also being less expensive.

> *To date, buyers have gravitated towards credits issued by registries like Verra, CAR, and Gold Standard, because (a) of their perceived credibility, or (b) it's required as part of a compliance market. The problem is, these legacy registries are extremely slow to develop methodologies for novel carbon removal solutions, and it's stalling purchases from buyers. They may also lack the scientific and technical expertise to properly evaluate emerging and increasingly diverse carbon removal solutions.*

What you'll find in the market

- ***Suppliers that are very early and have not developed a methodology.*** Suppliers at this stage should be focused on proving their technology works before developing a quantification methodology.
- ***Suppliers issuing credits against their in-house methodology*****.** Many suppliers have no plans to use a third-party registry given their shortcomings, administrative burden, and additional cost.
- ***Suppliers selling third-party registry-issued credits*****.** Some suppliers are capitalizing on the importance of third-party registry-issued credits to certain buyers and are working with a third-party registry to develop a methodology that works for their technology. A small minority of companies already have one established.

Appropriate buyer expectations for credits not issued by a third-party registry

- For anything beyond a purchase from a very early-stage supplier, ensure the supplier is actively developing a methodology if they don't have one.
- Only accept credits quantified using a methodology that has gone through an independent, expert review by the time of credit delivery.
- Request that the credits be audited by a third party, to ensure that the supplier followed their methodology when quantifying the credits.
- Ensure an **adequate discount** has been applied to your credits based on the uncertainty of the carbon removal pathway and specific technology, to make sure that one tonne purchased is actually one tonne delivered to you.
- Some suppliers are building their own registries, like **Charm Industrial**. While not critical, this can provide additional comfort that your credits aren't being sold twice.

Need credits issued by a third-party registry

If your company won't budge on this requirement there are still ways to get involved. If you need credits sooner than later, buy credits from the most promising carbon removal suppliers who have managed to establish a methodology with a third-party registry. If you can wait a few years, buy future credits from suppliers who aren't there yet but intend to get there.

Post-purchase

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Monitoring the performance of your portfolio

It's critical that you keep track of whether a supplier is sticking to the terms of your agreement. This includes delivering credits on time and with the backup you expect. **Monitoring performance helps you identify supplier delays, and proactively align on how to move forward given your respective goals.** Keep in mind that delivery delays are common for early-stage suppliers, and can be accepted if the supplier has a valid explanation and a solid plan moving forward. Tracking additional metrics can be beneficial if you're interested in the scale-up journeys of the suppliers you've purchased from, or the market as a whole. These metrics could support your company's external communications, or be shown to internal decision makers to maintain buy-in for your carbon removal efforts.

Metrics you should definitely be tracking:

- Is the supplier meeting your contracted delivery schedule?
- Are you being informed of any delivery delays?
- Are the credits coming with the agreed-upon certification?
- Is monitoring being carried out and reported on as per the agreed-upon methodology?
- Are you being compensated if the stored CO_2 is re-released?

Optional metrics if you're interested in the supplier's scale-up journey:

- Is the supplier achieving their growth milestones?
- Is their carbon removal capacity increasing?
- Are their costs coming down?
- Are they emitting less and less to run their process (net negativity)?

For buyers interested in the growth of the market as a whole, pull together the metrics from each supplier in your portfolio and look at the growth of your portfolio in aggregate. The following metrics will be telling:

- Total capacity of your portfolio
- Average cost of credits
- Average net negativity percentage

> ***Make a copy*** *of Shopify's supplier performance tracking spreadsheet for your company's purposes.*

Accepting, retiring, and allocating credits

There is a bit of work involved for the buyer when taking delivery of credits not issued by a third-party registry, less so for registry-issued credits. Regardless of the type of credits you're receiving, **it's important to keep organized records, especially if you've signed agreements with multiple suppliers**, with deliveries happening over multiple years. We've laid out some best practices below.

Accepting credits

- **Credits not issued by a third-party registry:** Before delivery, ensure the in-house quantification methodology was reviewed by an independent expert. Upon delivery, review the documentation provided alongside your credits; deliveries should outline tonnes removed, a breakdown of emissions from the process, any discount applied, and supporting documentation to validate each piece. For additional comfort, request an audit of your credits to guarantee the methodology was followed.
- **Registry-issued credits:** Take a look at the certificate you've received and ensure it includes the number of credits you're expecting to see, and an indication that the credits were certified and issued by the third party you were expecting.

Holding, retiring, and allocating credits

Once you've signed a contract with a supplier, set up a spreadsheet to stay on track. The spreadsheet should track payments, credits you're expecting to receive, credits you've received, and how you've allocated your credits. This is critical if you have multiple contracts spanning multiple years. It can be easy for you to lose track, and becomes even more important when other employees get involved.

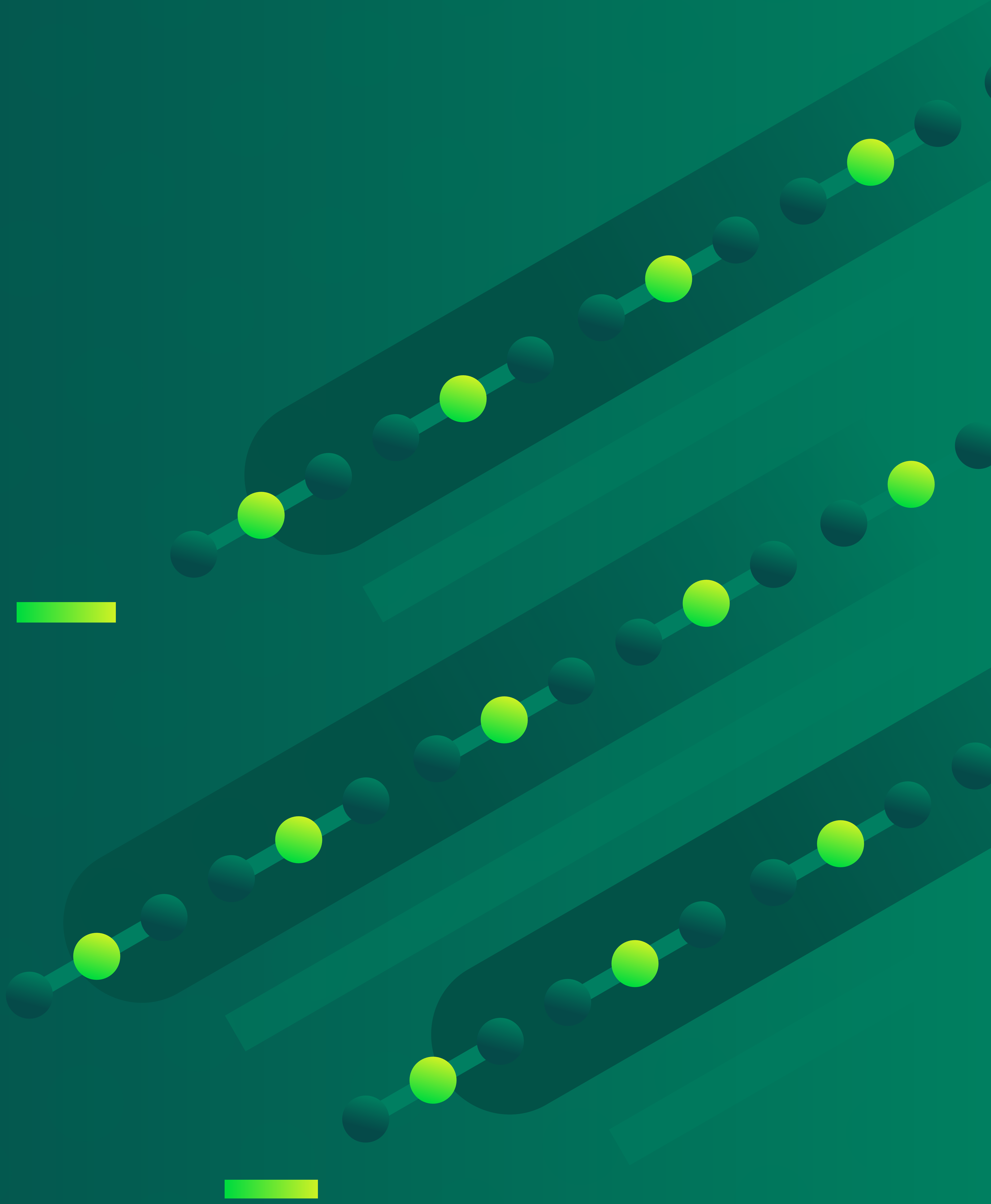
> ***Make a copy*** *of Shopify's credit tracking spreadsheet for your company.*

Conclusion

Carbon removal is shaping up to be one of the most important industries yet, but we need more companies to step up as buyers to take it to new heights. Buying carbon removal credits from game-changing suppliers helps them secure financing to get their technologies out of labs, into pilot facilities, and eventually deploying at massive scales.

So whether your company's climate budget is small or large, whether your carbon removal journey is just beginning or is already underway, follow these best practices developed by Shopify. They'll maximize your impact on high-potential carbon removal suppliers, minimize complexity and the amount of work involved, and help eliminate your company's emissions.

Get in touch with our team at Shopify with questions.



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