




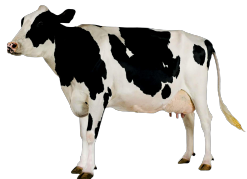






Speed & Scale 2024 Global Progress Report

*Unprecedented progress.
Far more urgency and ambition needed.*

April 2024

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Unprecedented progress. Far more urgency and ambition needed.

Dear friends:

In 2021, Speed & Scale outlined a path to save a livable planet. Our book and action plan put forward 10 objectives—each with its own set of milestones, or “key results”—to zero out the world’s 59 gigatons of annual greenhouse gas emissions,¹ before it’s too late.

Now, in a data-driven update, we assess the globe’s progress toward this monumental goal. The Speed & Scale tracker reveals where the world is making good headway on the road to net zero and where it’s lagging. Most important, it points to where we need to go from here in the transition to clean energy—in scaling renewables and cleantech and also in phasing out fossil fuels.

Since we last took the measure of the global emissions crisis, it has grown even more dire. The year 2023 was the hottest in human history.² The world is now staring at a 2030 emissions gap—the difference between what’s projected to be cut and what needs to be cut—of some 20 billion tons of carbon.³ We still have a window for avoiding the most severe impacts of global warming, but it won’t stay open without more urgent action.

The bright spots? Innovation and investment.

Our top-line goal may seem daunting. But with transportation and the power grid accounting for more than half the world’s emissions,

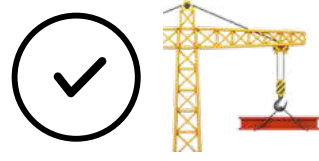
recent developments have renewed our confidence that net zero is attainable.



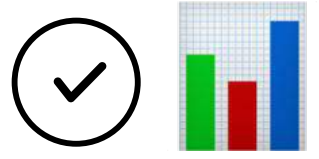
Electronic vehicles (EVs) have skyrocketed in popularity. From 2019 to 2023, global market share jumped 6x to 18 percent.⁴



Solar and wind costs have plunged to historic lows.⁵ In 2023, new deployment of renewables increased by 50 percent.⁶



Project financing for cleantech has nearly doubled since 2019 and is on track to exceed \$1 trillion by 2030.

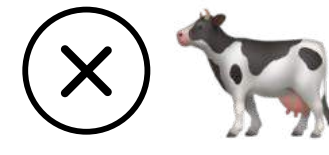


Venture capital—a prime driver of cleantech innovation—has exceeded \$50 billion annually for each of the last three years, up from \$17 billion in 2020.⁷

Where we're lagging

Our updates on three critical objectives—heavy industry, the food system, and carbon removal—show little or no recent progress toward net zero. To spur the next wave of breakthroughs, early investment is essential.

The countries and companies that scale innovation will gain a huge competitive edge. Consider these untapped opportunities:



Food has yet to be fixed. Beef is the number-one emissions culprit in our food system. Today's plant-based substitutes aren't cutting it, at least not yet. And cultured, lab-grown beef has yet to prove it can scale—or that consumers will accept it.

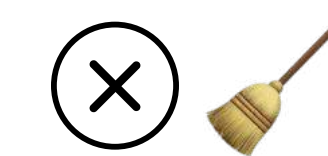
In a moment where we need more investment in the category, innovation funding is down. But this is just round one. The next iteration of plant-based proteins needs to beat real meat on taste, price, and health. The emissions cut opportunity amounts to 3 gigatons per year.



Industry is still dirty. In 2022, near-zero-emissions steel and cement accounted for less than 1 percent of their respective markets.⁸

Governments and businesses should invest in advance purchasing commitments to scale innovation for the cleaner materials of the

future. The potential annual emissions cut payoff is massive—3 gigatons for steel, 2 gigatons for cement.



For carbon removal, it's early days. Our 2030 goal for engineered carbon removal is one billion tons, en route to our target of 5 gigatons per year in 2050.

To date, the world's cumulative removal efforts amount to barely 200,000 tons. Again, we need a buying spree to catalyze the removal market at scale and make the technology more affordable.

The other piece of the puzzle

While there remains much work to do, our update reflects strong overall progress in scaling renewables and clean technologies. But ours is a two-sided quest. By itself, scaling innovation and investment will not be enough.

To cut emissions to net zero, we need to sunset the carbon era.

The world is now burning twice the amount of oil, gas, and coal consistent with a 2050 net zero trajectory.⁹ To disrupt this toxic status quo, we call upon countries to move on several fronts at once: to enact stricter emissions standards, set a meaningful price on carbon, curb leaks of heat-trapping methane, and end direct subsidies for fossil fuels—to stop underwriting our own demise.¹⁰

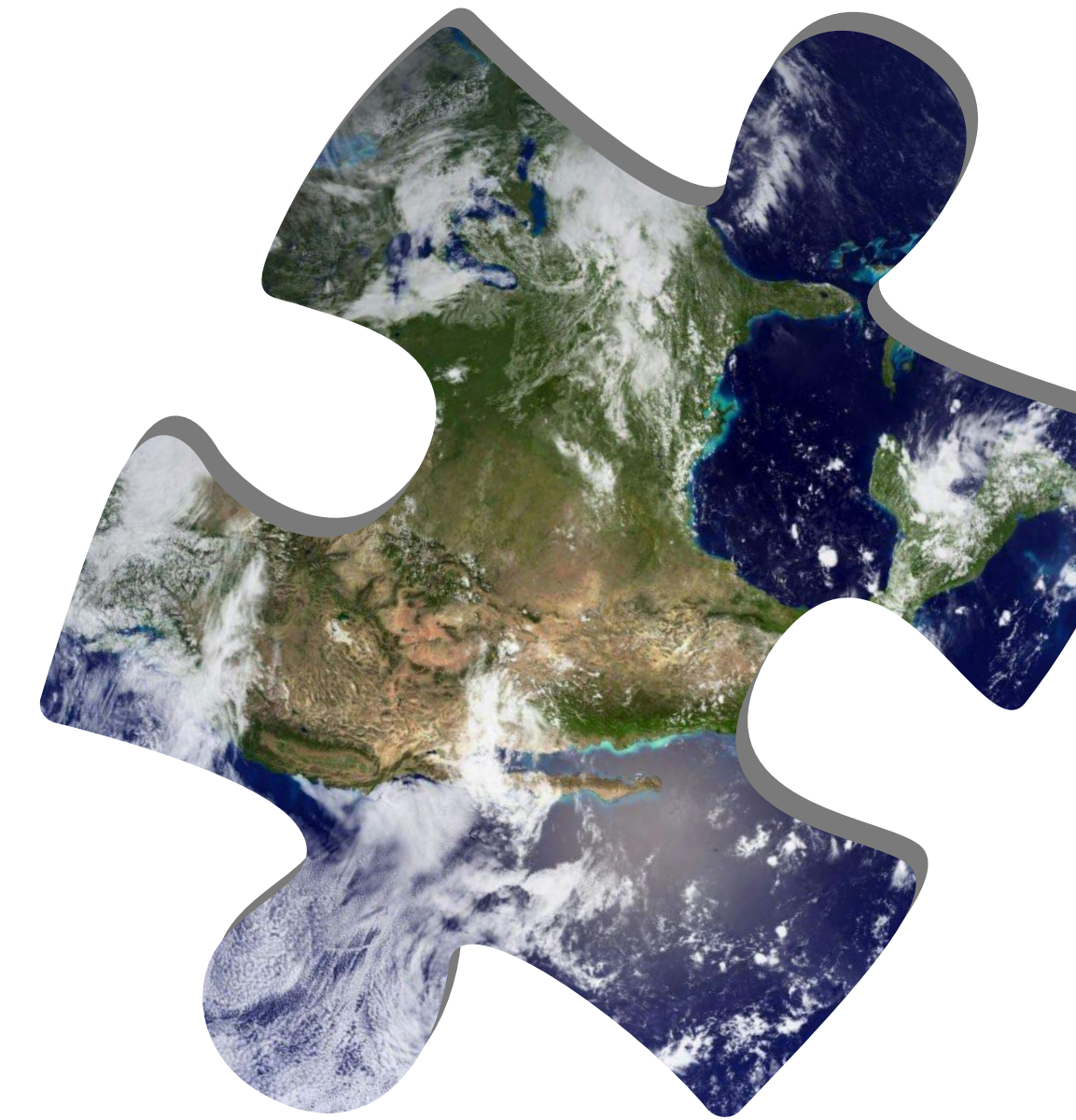
What's next

Since 2014, around the time countries began to pay serious attention to the climate crisis, projected planetary warming has dropped by 1.2 degrees Celsius.¹¹ For a problem some fear is too big to solve, this progress should be shouted from the rooftops. At the same time, we know that the next round of emissions cuts will be a much heavier lift than all we've accomplished to date.

As we look toward COP30 in 2025, countries will have the chance to strengthen their climate commitments and tie them to rigorous action plans to end their reliance on dirty energy. By gauging where the world stands, our tracker update aims to help leaders meet the greatest challenge in human history.

In sum, we've made extraordinary advances over the last three years—and have so many miles to go. Onward, together!

John, Ryan, Anjali, and the Speed & Scale team



Speed & Scale 2024 Global Progress Update

ACHIEVED

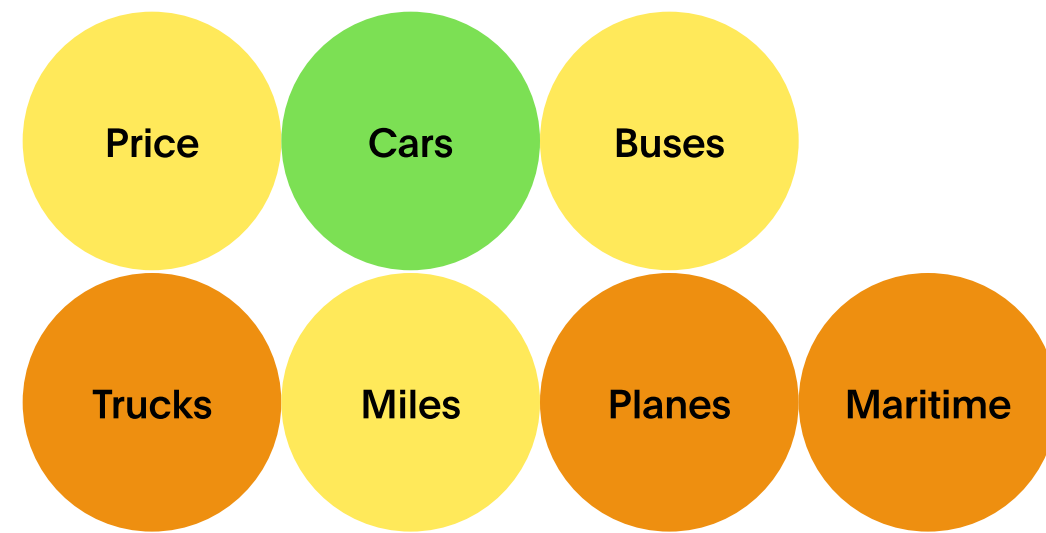
ON TRACK

INSUFFICIENT PROGRESS

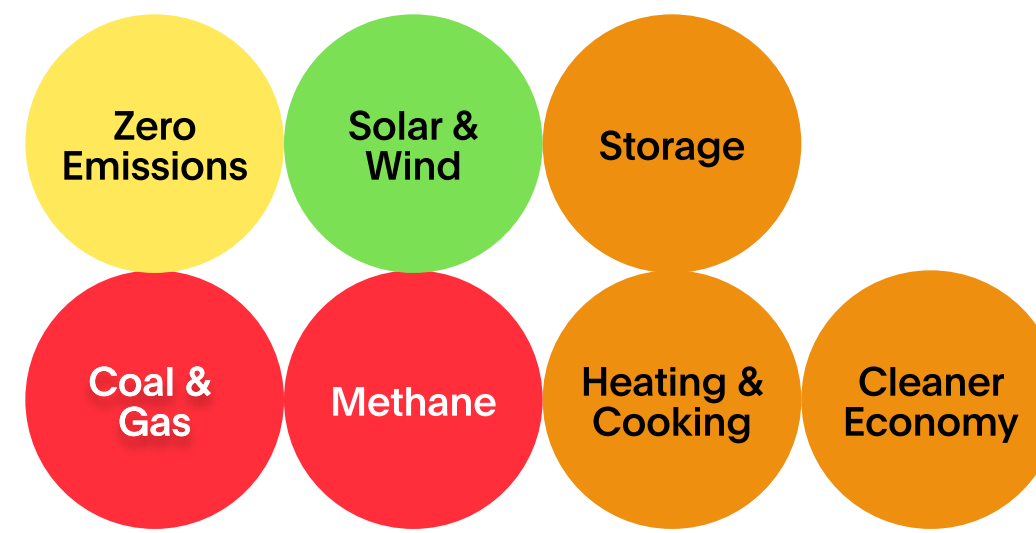
FAILING

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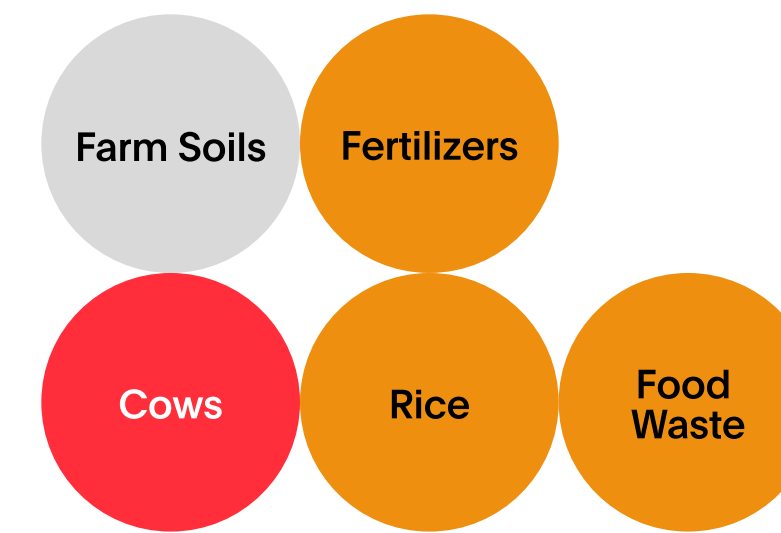
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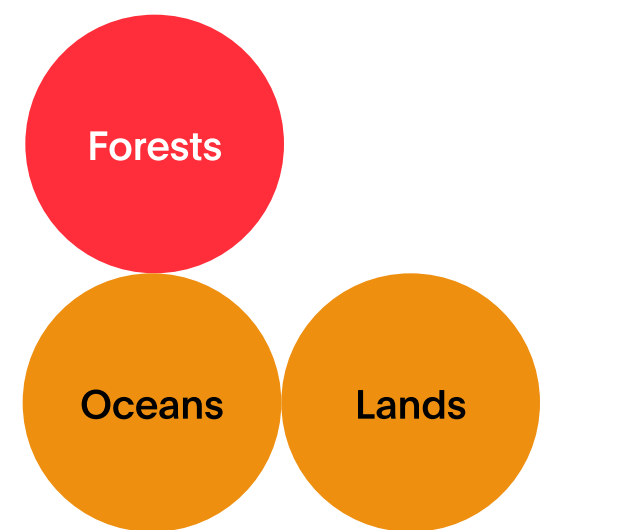
Electrify Transportation



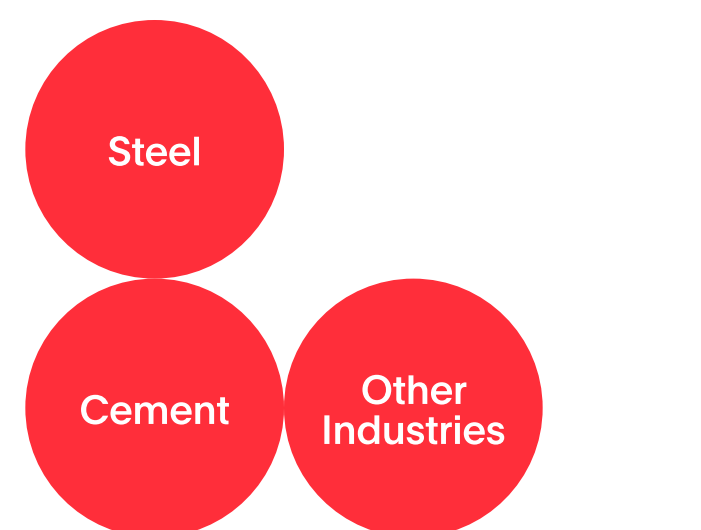
Decarbonize the Grid



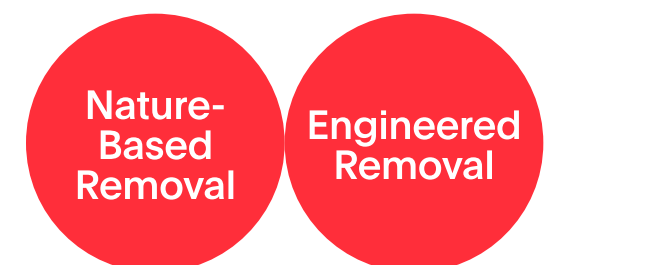
Fix Food



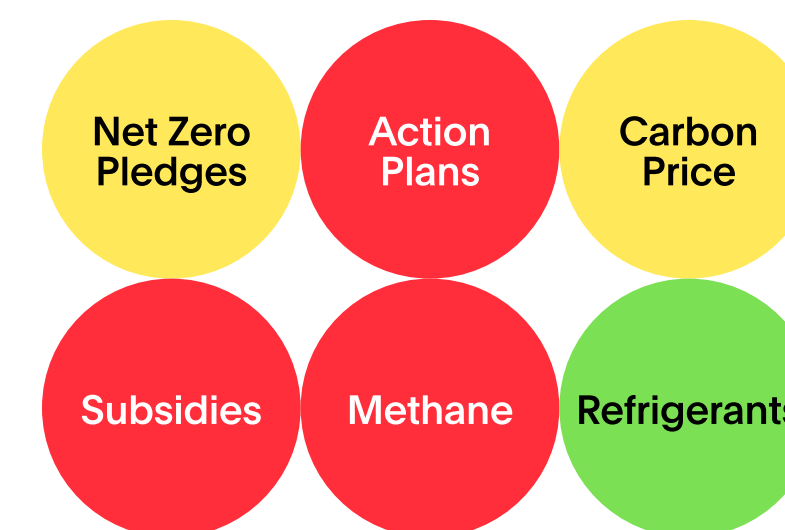
Protect Nature



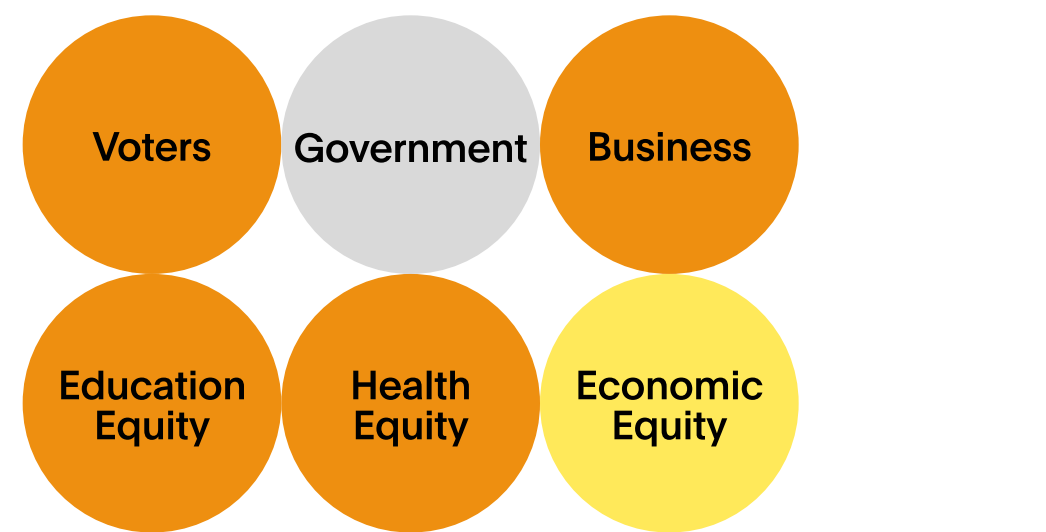
Clean Up Industry



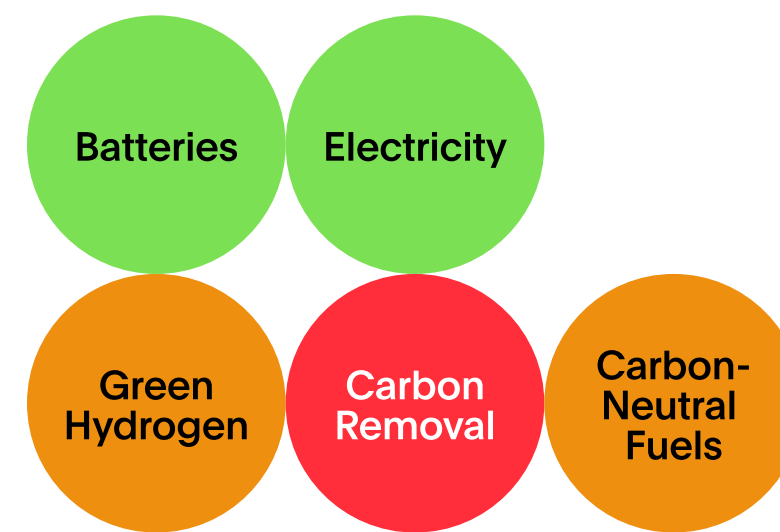
Remove Carbon



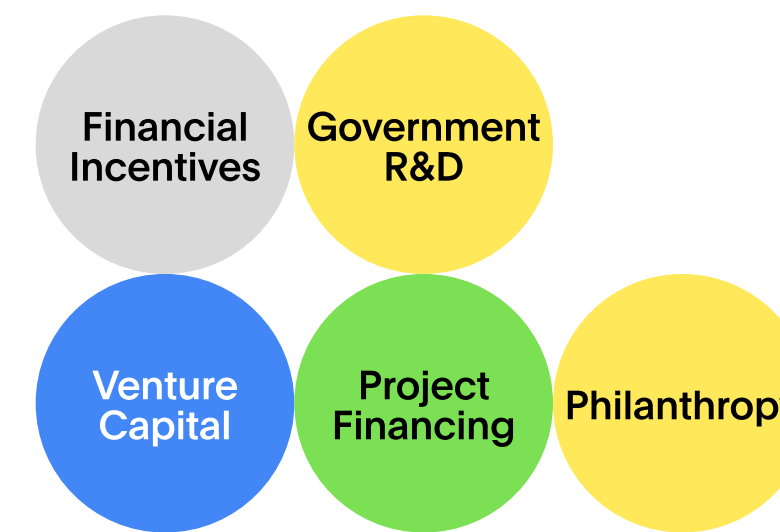
Win Politics and Policy



Turn Movements Into Action



Innovate!



Invest!



Electrify Transportation

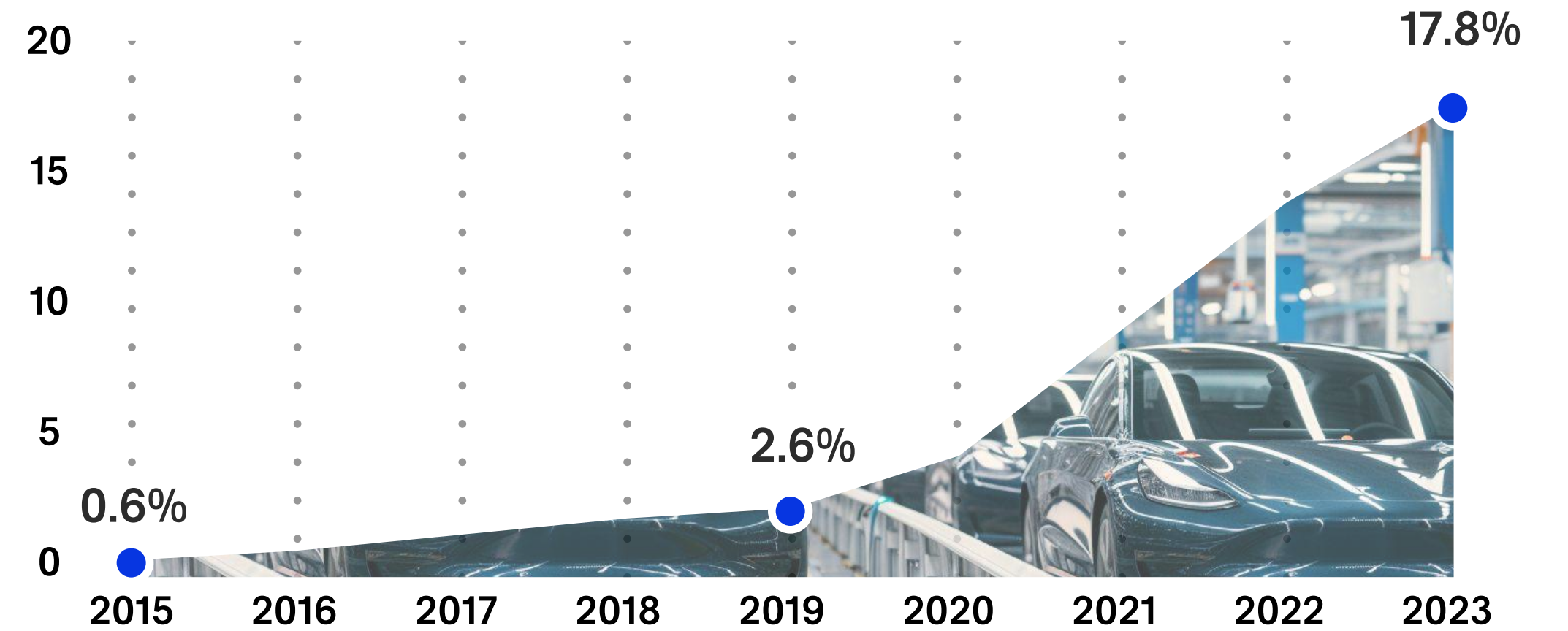
1.0

The best news in climate is cars.

Of all the sectors of the global economy, the one making the fastest progress toward net zero is transportation. It's now clear that the shift to electric cars is not a question of if, but of when; the transition is well underway. Between 2019 and 2023, the global EV share of new car sales rose from less than 3 percent to nearly 18 percent¹²—a trend driven by increased affordability. In 2008, the first Tesla Roadsters drove off the parking lot at a sticker price of around \$100,000.¹³ Today, a Tesla Model 3 costs less than \$40,000.¹⁴ China's BYD Seagull retails for under \$10,000.¹⁵

EV sales are rising

Percentage of new car sales that are electric*



SOURCE: BLOOMBERGNEF, 2023

NOTE: *SALES OF BATTERY ELECTRIC VEHICLES (BEVS) + PLUG-IN HYBRID ELECTRICS (PHEVS)

1.1

Price

1.2

Cars

1.3

Buses

1.4

Trucks

1.5

Miles

1.6

Planes

1.7

Maritime

ACHIEVED

ON TRACK

INSUFFICIENT PROGRESS

FAILING

CODE RED

LIMITED DATA

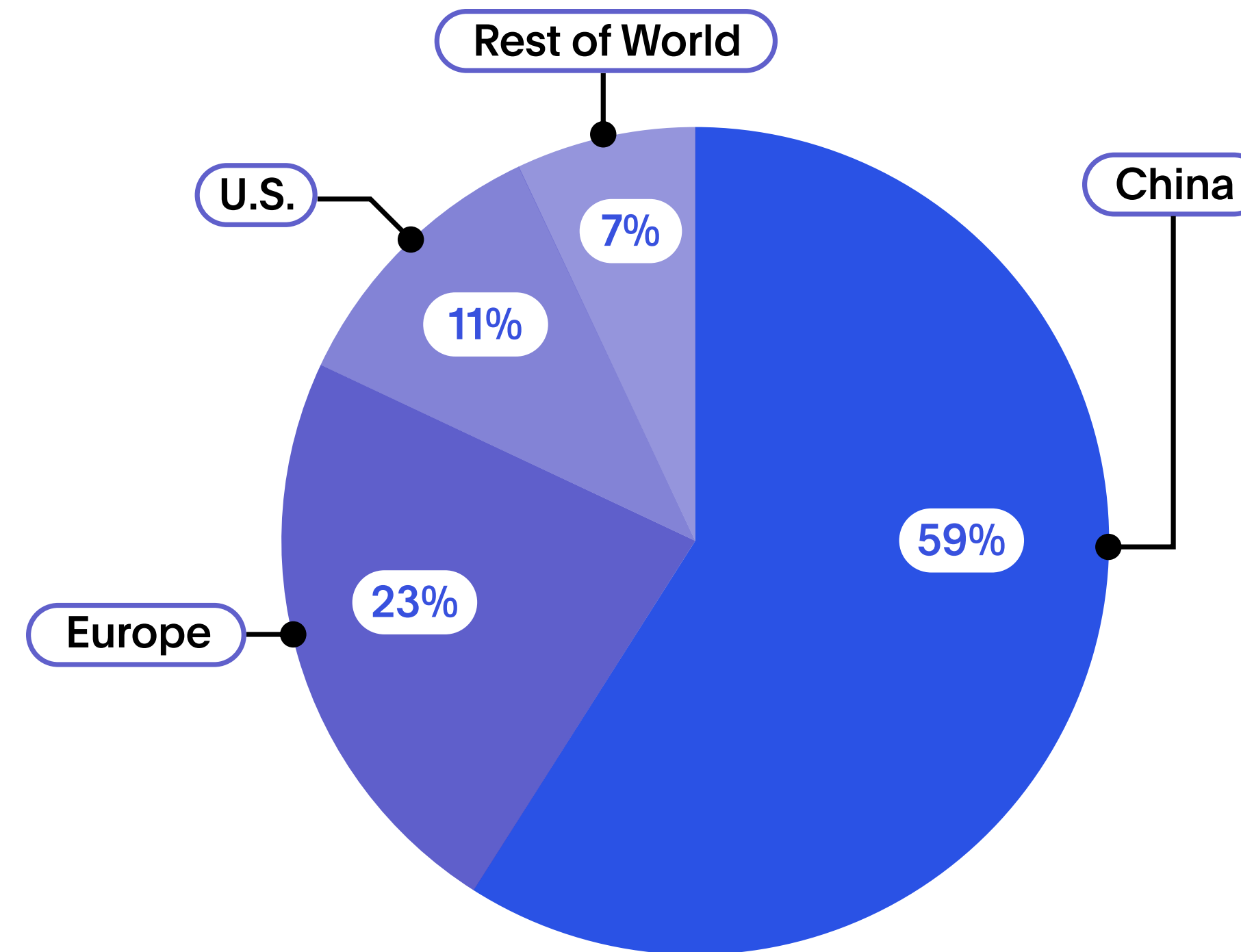
China is out front on EVs

Now producing more EVs than the rest of the world combined, China is the undisputed leader in the auto industry of the future. By 2030, China will control one-third of the total global auto market.¹⁶ What can the rest of the world learn from its success?

To begin with, China invested early in new technologies, well ahead of the game. At the same time, it adopted an effective mix of policies to prod both manufacturers and consumers to get on board. Over the last 15 years, the Chinese government has spent tens of billions of dollars on EV subsidies; it has exempted EVs from sales taxes since 2014.¹⁷ China incentivizes every domestic carmaker to dedicate a set percentage of its output to EVs.¹⁸ And it mandates on-site EV chargers for all new residential communities and workplaces.¹⁹



Global passenger EV share in 2023*



SOURCE: BLOOMBERGNEF, 2023

NOTE: *SALES OF BATTERY ELECTRIC VEHICLES (BEVS) + PLUG-IN HYBRID ELECTRICS (PHEVS)

The upshot

Due in large part to China's focus and ambition, global EV sales are on a net zero trajectory. By 2030, it's estimated that nearly half the world's new passenger vehicles will be electric.²⁰ That's stunning progress—with two caveats. First, legacy automakers in the U.S. and Europe are making slower-than-expected progress.²¹ Second, EVs have yet to gain much traction in a number of important markets, including India, Japan, and Brazil.²² But the race is on, and many of these countries have recently enacted incentives to speed adoption.

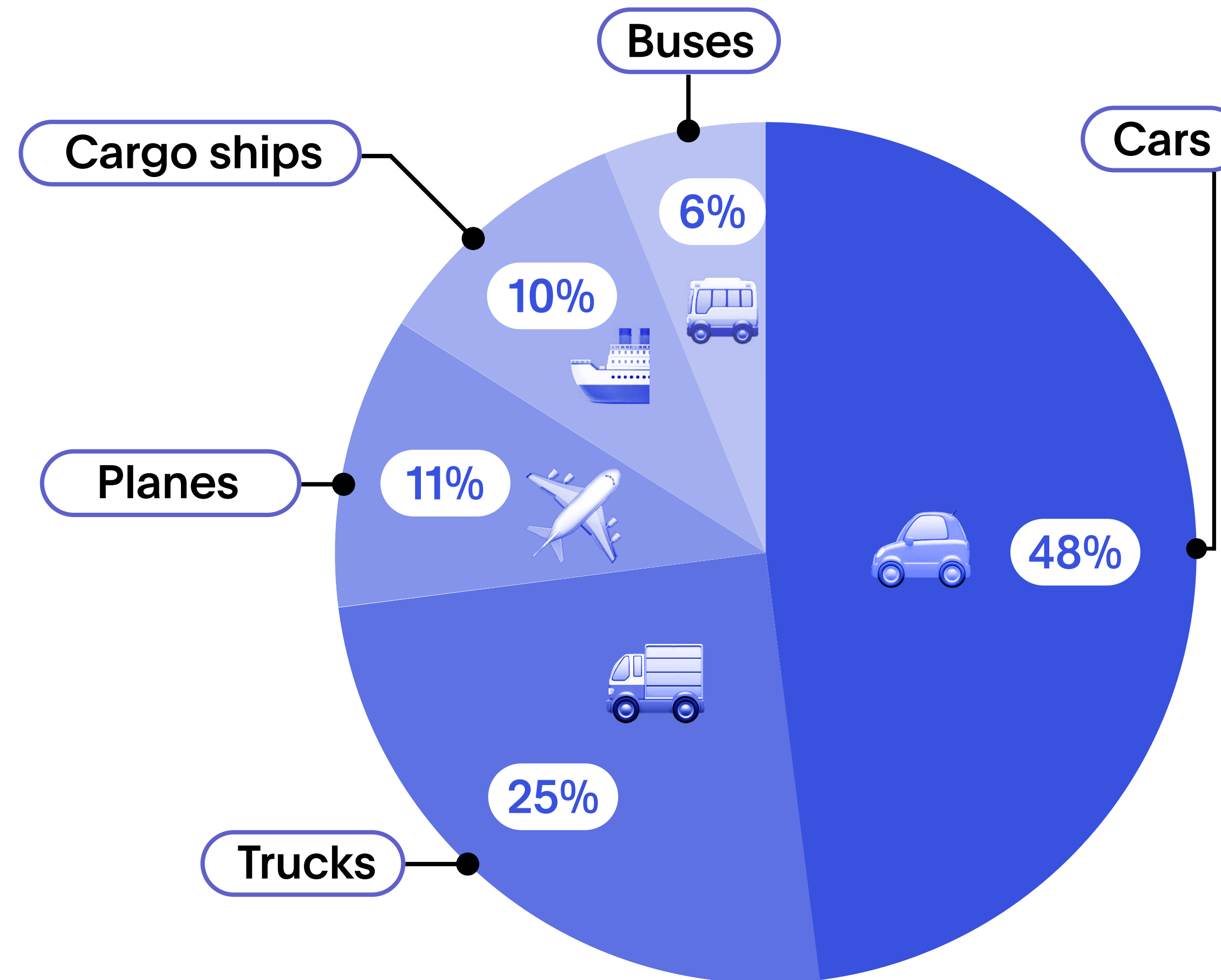
Leaders and laggards

Two categories making even more headway than cars are buses and two- and three-wheelers. In fact, most of the EV-linked reduction in global oil demand has come from electric motorcycles, scooters, and bicycles,²³ the vast majority of which are sold in China.

Against this good news, clean alternatives lag in trucking, aviation, and shipping, which account for nearly half of all transportation emissions.²⁴ Today's potential solutions—battery-powered long-haul trucks, sustainable aviation fuel, green ammonia for ships—are at present too pricey for broad deployment.

Using EVs as the template, we need amped-up investment and aggressive policy to drive adoption of clean trucks, planes, and ships. The countries that get out front will gain a huge competitive advantage in crucial technologies for the 21st century.

Less than half of transportation emissions come from cars



SOURCE: IEA, 2020

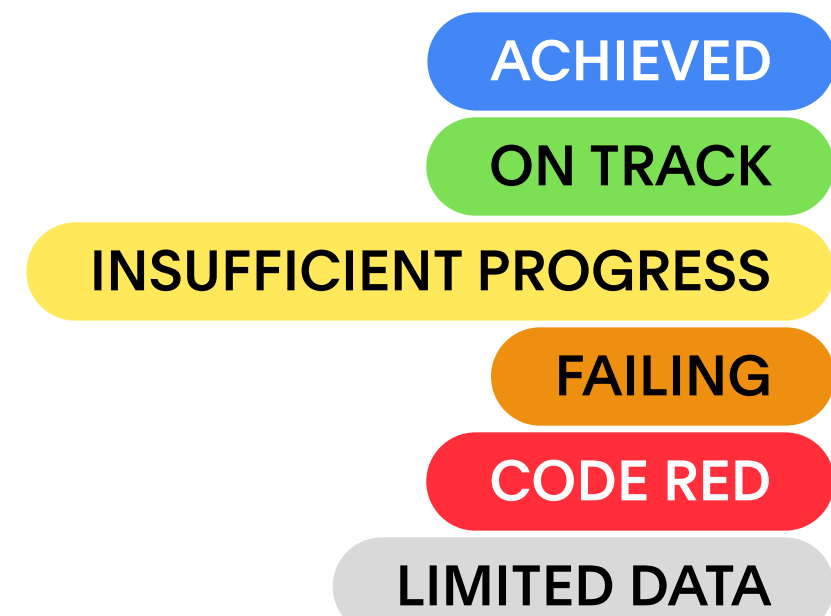


Decarbonize the Grid

2.0

Growing demand—and stubborn fossil fuel production—impede a cleaner global grid.

The single largest source of greenhouse gas emissions—24 gigatons, or 40 percent of the climate crisis—is electricity. Today’s grid is powered by a mix of fossil fuels and clean energy, in roughly a two-to-one ratio.²⁵ Global power production is projected to be 50 percent clean by 2030.²⁶ While that may sound impressive, it’s too little and too late. To cut power sector emissions by 90 percent by 2035, we need the cost of renewable energy—including storage—to be cheaper than fossil fuels everywhere.



Relentless demand for energy

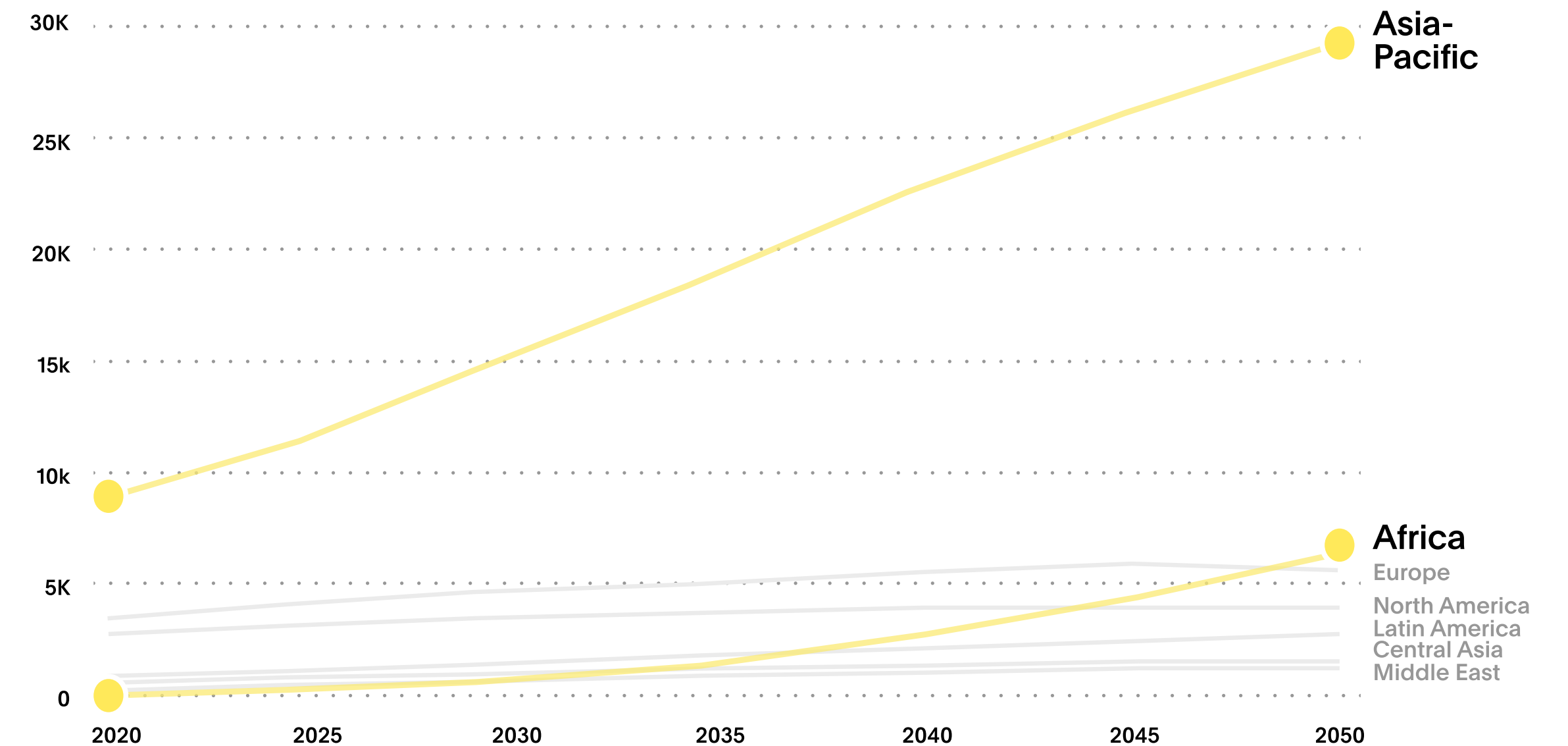
In the decades to come, the world in general—and emerging economies in particular—will have an insatiable appetite for more energy. By 2050, demand could double in the Asia-Pacific region and grow by nearly a factor of 10 in Africa.²⁷ As rising populations reach for a higher quality of life, we’ve yet to develop even close to enough wind and solar to serve them. We must either pick up the pace of clean energy deployment or accept the inevitable outcome: New fossil fuel capacity will continue to be built.

In 2023, renewables covered an estimated 80 percent of new global demand for electrical power.²⁸ **The ultimate goal—the net zero goal—is a grid powered by enough clean energy to meet all demand.** To get there by 2040, we need to triple renewable energy by 2030 and become twice as energy-efficient.²⁹ This leap demands increased investment in clean energy storage and transmission for solar and wind. It also requires more deployment of more reliable clean sources: nuclear, hydro, and geothermal.

In the U.S., meeting this massive challenge will hinge on permitting reform and the easing of other bottlenecks that slow the build-out of new transmission lines.³⁰ In emerging economies, the main roadblock is a lack of access to capital from low-cost project financing.

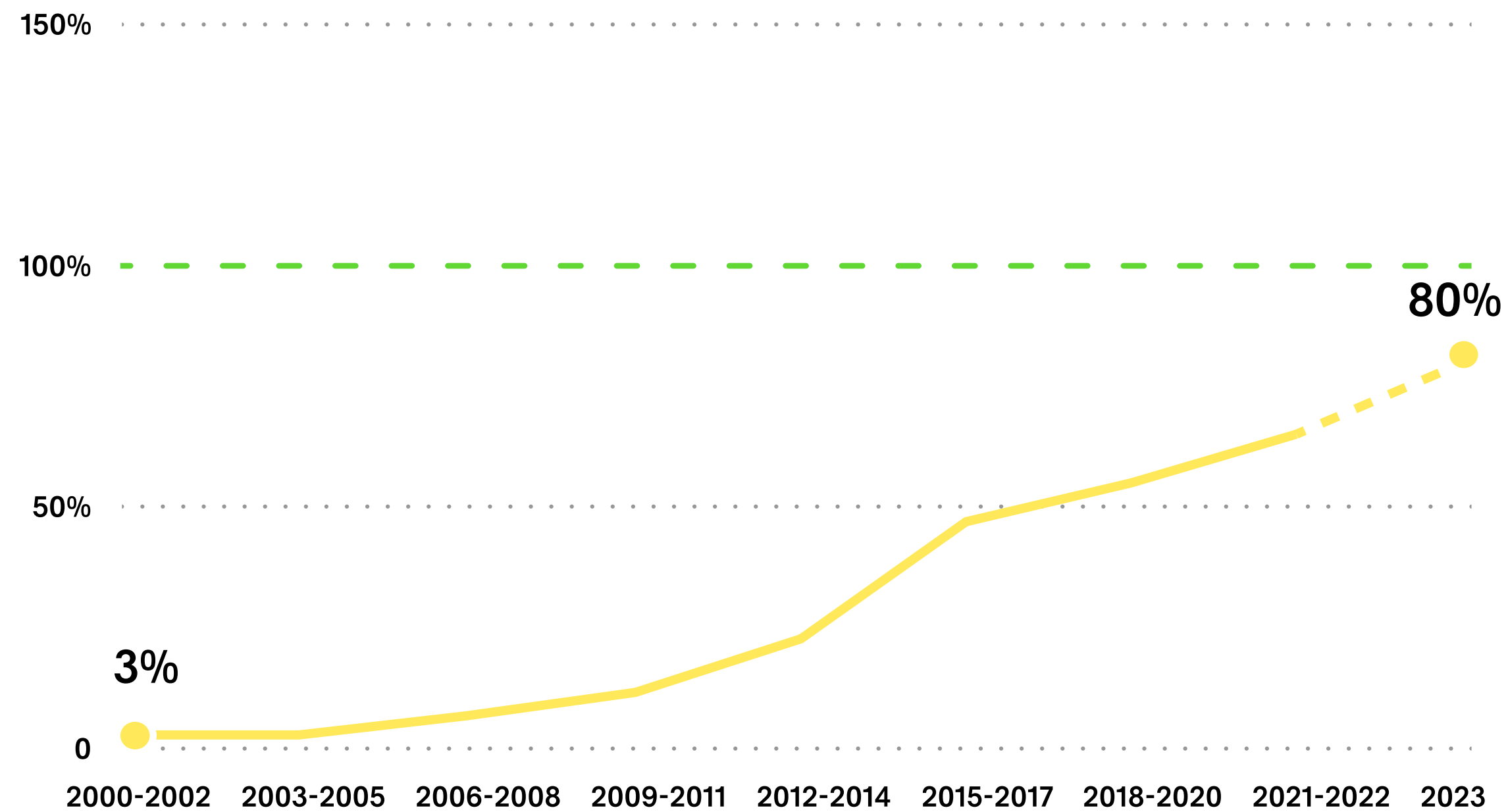
Growing electricity demand

Projected terawatt-hours



SOURCE: ENERGY AND EMISSIONS PROJECTIONS 2050, ENERDATA 2023

Percentage of new electricity demand met by deploying renewables



SOURCE: EMBER CLIMATE, 2023

THREE-YEAR MOVING AVERAGE; YEARS WHERE DEMAND DROPPED ARE EXCLUDED

Countries importing fossil fuels will find real energy security by building out renewable energy within their own borders. Solar, wind, hydro, and geothermal, along with increased storage, are their tickets to a more resilient future.

Kicking the habit

Three years ago, Speed & Scale called for an end to new coal and gas installations in the U.S., Europe, and other advanced economies after 2021. We hit the target on coal but are moving backward on gas. In fact, in 2023, the United States and Europe installed a total of 19 new gas plants.^{31,32} Not coincidentally, global greenhouse gas emissions continue to rise.

Breaking this cycle of dependency won't be easy. Fossil fuels are viewed as linchpins of global energy security, especially in volatile times. For many, it's impossible to imagine a world without them. But after Russia invaded Ukraine in 2022, this conventional wisdom imploded. As sanctions and supply cuts disrupted global energy markets and sent prices soaring, much of Europe

faced acute shortages. Only a record-shattering warm winter spared many from a state of desperate energy scarcity.³³

In reality, the world's fossil fuel economy is a blueprint for energy instability. Countries importing fossil fuels will find real energy security by building out renewables within their own borders. Solar, wind, hydro, and geothermal, along with increased storage, are their tickets to a more resilient future.

While cleantech innovation and investment are essential in the high-stakes race to reach net zero by 2050, by themselves they are insufficient. A two-front approach is necessary: to deploy clean energy with speed and scale and simultaneously phase out fossil fuels.



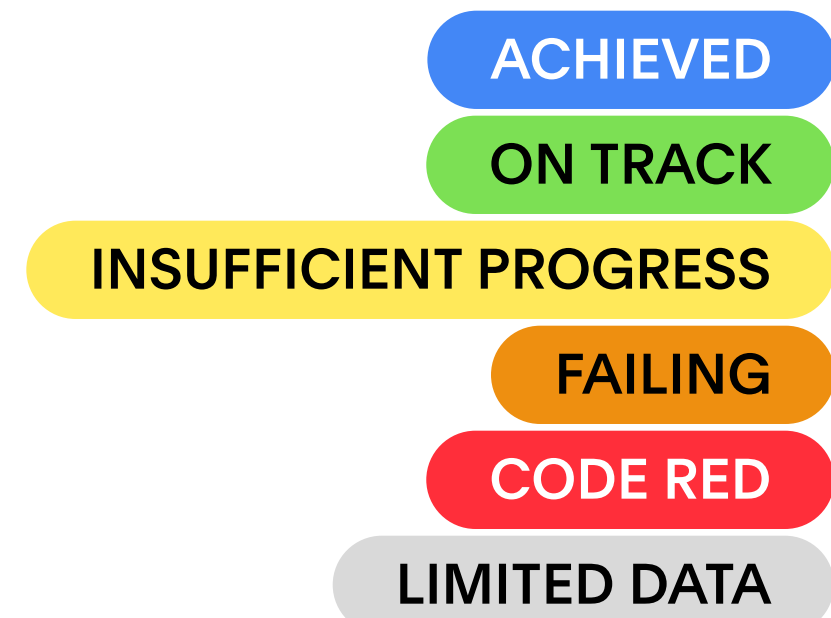
Fix Food

3.0

Fake Meat 1.0 fell short; 2.0 can't come soon enough.

The number one source of greenhouse gases in the food sector is the cow.³⁴ As nonstop founts of gas and manure, cows emit methane that's equivalent to 3 gigatons of carbon dioxide per year.³⁵

There are two ways to cut these emissions. One is to shift consumer demand toward lower-emission proteins such as chicken or fish or toward plant-based alternatives that satisfy people's passion for beef. The other is to reduce food-linked methane at its source, with climate-friendly practices in the beef and dairy industries. Emissions from cows can be cut by adding seaweed to their diets, managing manure in more sustainable ways, or even editing cows' genes. But all of these are early-stage solutions that have yet to be deployed at scale.



Where's the beef?

The first serious attempts at beef substitutes failed to capture demand. In fact, when people try these processed alternatives for the first time, roughly half don't like them.³⁶ And while cultured, lab-grown beef might more closely replicate the real thing, it has yet to prove it can scale—or that consumers will accept it.

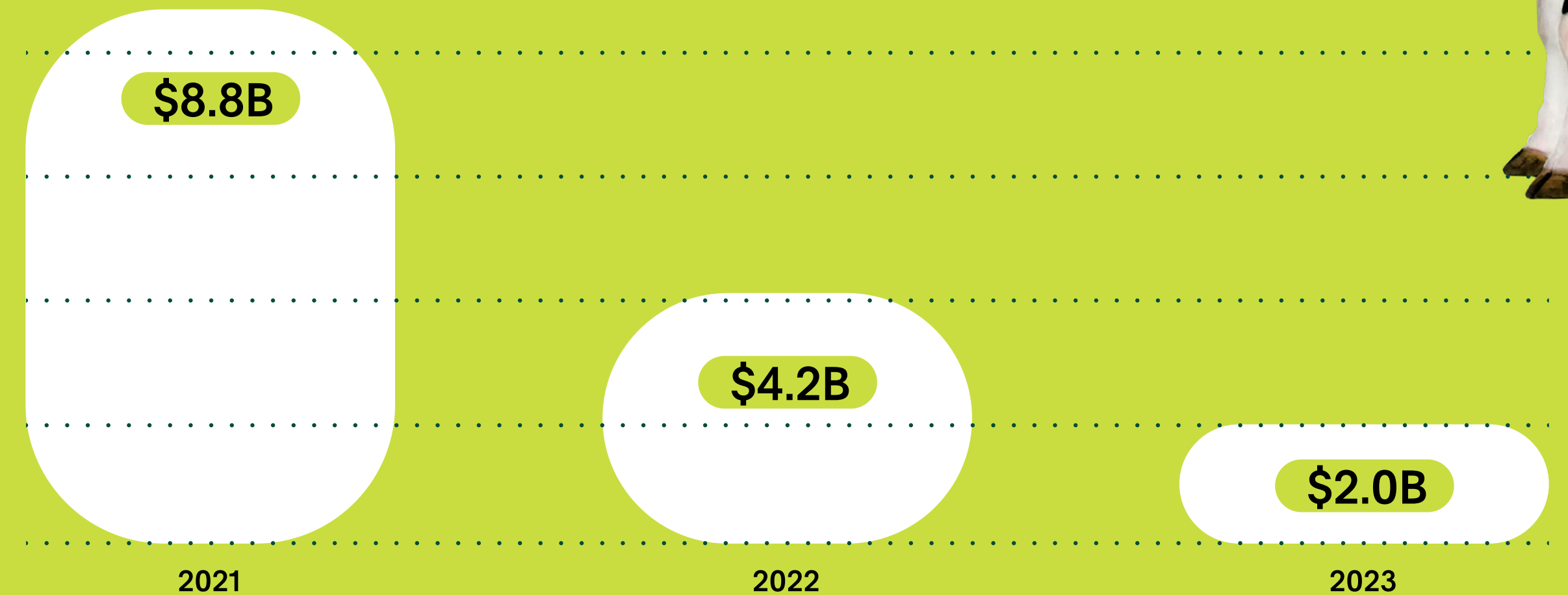
Meanwhile, over the last two years, investment in clean food tech has slumped more than 75 percent in a category where more funds are sorely needed.³⁷

These setbacks aside, the challenge is not insurmountable. According to a 2023 survey, plant-based milks account for 19 percent of all milk sold globally³⁸—grounds for optimism. **When superior options are at hand, consumer behavior can change.**

Fake Meat 1.0 under-delivered, but it's only round one. To counter the world's growing demand for beef, the next round of substitutes will need to win on taste, affordability, and health.



Investment in clean food tech has cratered Venture capital funding



SOURCE: BLOOMBERGNEF, 2023





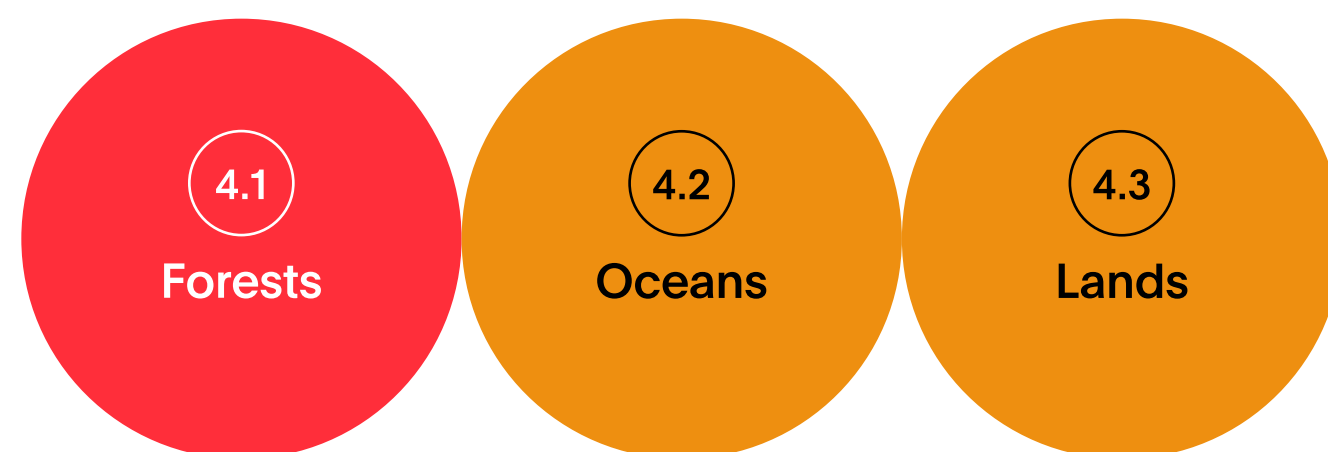
Protect Nature

4.0

Our forests are under siege.

Carbon sinks are nature's storage centers. They absorb carbon dioxide from the atmosphere and hold it where it does no harm. Forests, oceans, peatlands, and permafrost are critical components of the math for net zero. Over the last four years, however, these sinks have continued to be ravaged; safeguards are uneven at best. Most alarmingly, the world is Code Red on deforestation, the massive and intentional clearing of trees on nearly every continent.

It's not just destruction for profit. In 2023, Canadian wildfires broke all previous records for North America. Burning acreage twice the size of Portugal, they emitted nearly 2 gigatons of CO₂e, poisoning the air far beyond Canada's borders.³⁹



A flawed instrument

Protecting forests begins and ends with government policy and enforcement. But it also requires investment, consumer pressure, and active participation up and down supply chains. In 2022, the private sector invested over \$2 billion in the voluntary carbon markets.⁴⁰ Companies seem willing to fund efforts to preserve and restore the world's forests, and that's a good thing.

The bad news is that these markets generally are not working. The carbon credit system, designed to help countries and companies negate their emissions by cutting emissions elsewhere, cries out for greater transparency, independent oversight, and more stringent verification.

Two bright spots

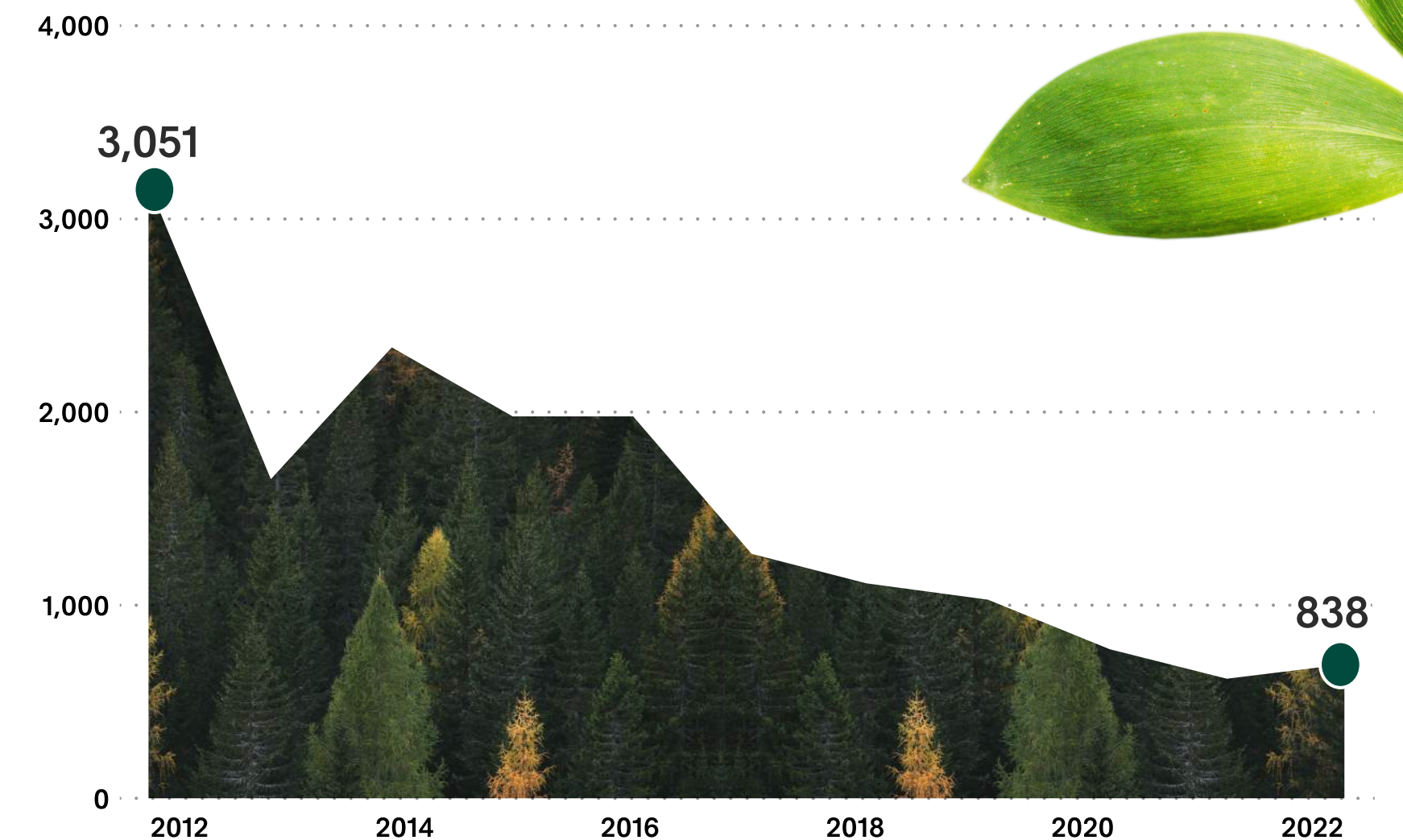
In 2023, Brazil cut deforestation in the Amazon rainforest in half by enforcing laws already on the books.⁴¹ This sort of progress is fragile, however, as it relies upon having a climate-friendly administration in power.

A more sustainable and replicable model can be found in Indonesia. Not so long ago, its tropical rainforest was disappearing faster than almost anywhere else. Then a coalition of public and private actors revitalized the country's ecosystem and turned back the tide of deforestation. It's a success story in three parts.

First, the national government issued a strict ban against wholesale deforestation. Second, consumer product companies took an active role in tracking plantations and palm oil trade that damaged forests. Finally, grassroots action groups called out supply chains doing business with bad actors.

Deforestation is down in Indonesia

In square miles



SOURCE: GLOBAL FOREST WATCH, 2023

The results have been nothing short of inspirational. Between 2015 and 2021, the rate of forest loss in Indonesia fell by more than half to its lowest level in two decades.⁴² The lesson? Returning the world to something closer to a state of nature—and restoring our carbon sinks—will demand active human intervention.



Clean Up Industry

5.0

It's still dirty.

The notoriously “hard-to-abate” sectors of steel and cement are proving to be just that, with multi-gigaton-level consequences. Every key result in this objective is Code Red, and the problem is poised to get worse—even though domestic needs in China have leveled off.⁴³ By 2050, the net zero target date, other growing economies will push global demand for both steel and cement about 50 percent higher than 2020 levels.⁴⁴



The dawn of green materials

In advanced economies, the imperative is to produce cleaner alternatives that enable the development of lower-emitting cities and infrastructure. In Europe, a few small clean steel plants are set to open shop, thanks to automakers and others demanding greener materials—and being willing to pay more for them.⁴⁵ By 2030, it's projected that close

to 100 million metric tons of steel will be produced by green steel plants, compared to around 10 million tons in 2023.⁴⁶

That represents real progress, but it's a thin slice of today's global steel market of about 2 billion metric tons.⁴⁷ And for the most part, low-emissions steel is prohibitively expensive, as much as 70 percent more costly than today's standard.⁴⁸

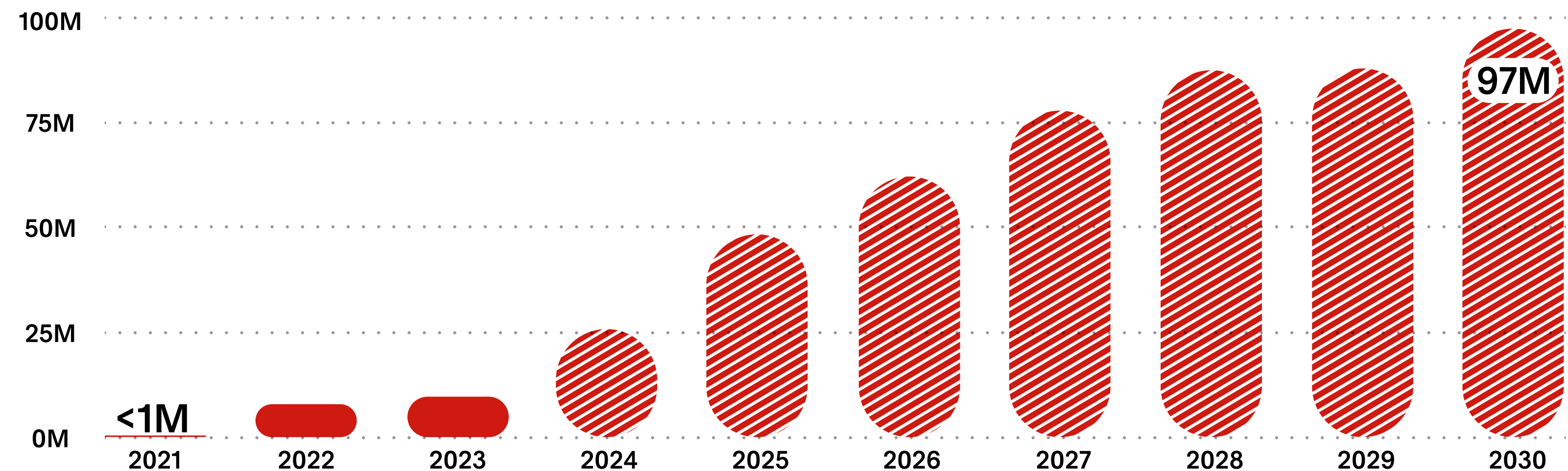
To make green steel more cost-competitive, more plants need to come on line.

Since 2019, more than 50 cement companies have received venture funding to develop new chemistries and methodologies.⁴⁹ But it will take years for these technologies to be deployed at scale.

Planned low-carbon steel production capacity

Metric tons (total)

ACTUAL
PLANNED



SOURCE: BLOOMBERGNEF, 2024

Where are today's opportunities?

Against this sobering backdrop, there are viable short-term strategies to mitigate greenhouse gases from industry.


One is greater efficiency from more strategic use of building materials. By wasting less cement and recycling steel, builders can substantially cut their emissions.⁵⁰

Another avenue is to prime the pump for new markets. For governments and businesses ready to fund a cleaner future, advance purchasing can help startups raise capital and scale, thereby driving down costs. Voluntary efforts are already underway to pool demand and send a powerful market signal.

Finally, in chemicals and plastics, budding technology for low-carbon heat applications shows promise.

The basic reality is that private industry needs assistance from the public sector. To help steel and cement companies overcome high costs, governments can implement incentives and mandates.

To speed the transition to green materials, the clean industrial choice must become the cheaper choice.



To speed the transition to green materials, the clean industrial choice must become the cheaper choice.



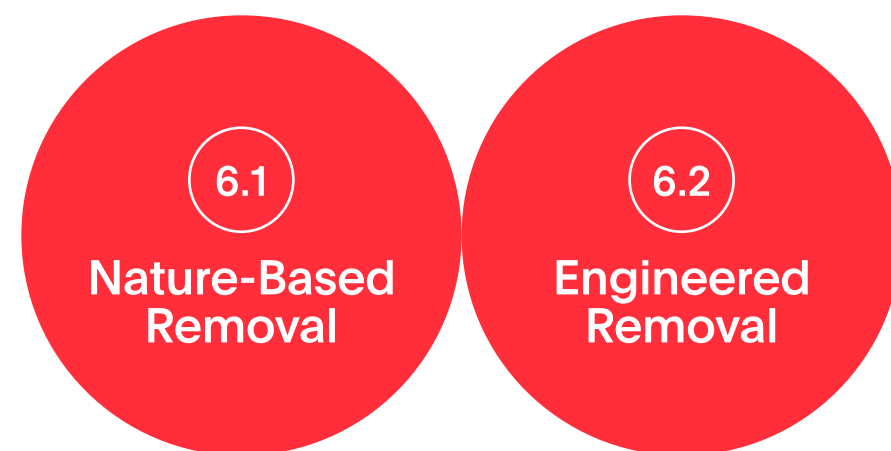
Remove Carbon

6.0

It's early days. More guidance, more guardrails, and a lot more removal needed.

Net zero math is unforgiving. Even if the world achieves Speed & Scale's first five objectives, we'll still be emitting at least 10 billion tons of greenhouse gases in 2050—and every year thereafter.⁵¹ And the longer that drastic emissions cuts are deferred.

At present, the world stands at Code Red on this objective—both for nature-based carbon removal, as in forest restoration and the cultivation of kelp, and for engineered removal efforts, such as direct air capture.



Unanswered questions

It's very early days for carbon removal. Like most early-stage technologies, it's highly expensive. As of the end of 2023, companies had pre-purchased only 5 million tons,⁵² a sliver of an iota of what's required. And far less than that has been actually removed.

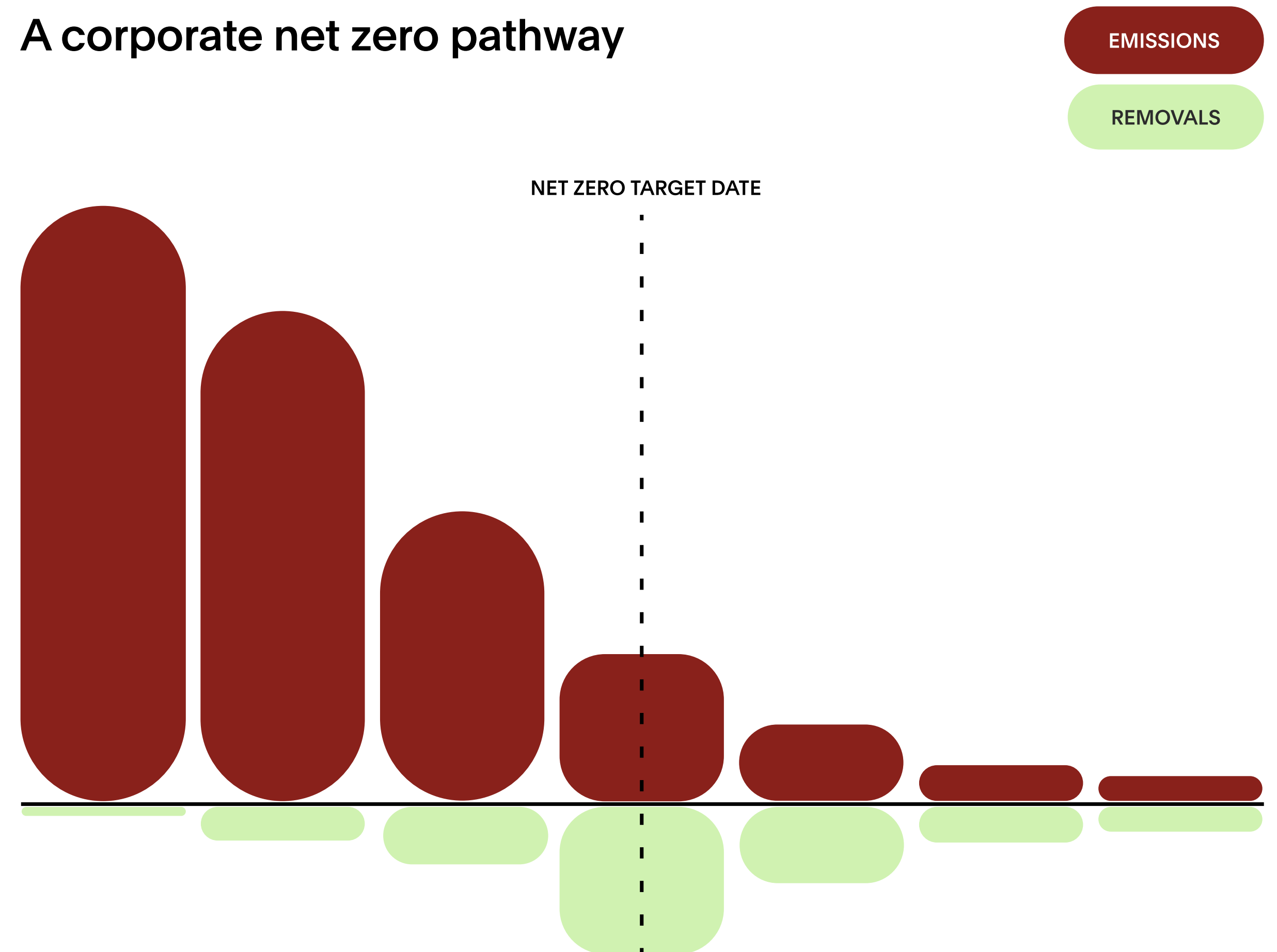
The challenge is to build out carbon removal on a scale that would make it more affordable and put a serious dent in global emissions.

The next step is a buying spree, with more ambitious purchases and faster delivery.

But companies feeling their way into this new arena are mostly stumbling in the dark. When should a company start purchasing carbon removal? And how much should it buy?

The first answer is straightforward. To catalyze the removal market, more removal needs to be bought today. On the matter of quantity, experts and standard-setters should provide better basic guidance. Speed & Scale calls for companies to pay for the removal of 0.01 percent of their emissions and then to scale up these purchases each year.

A corporate net zero pathway



SOURCE: SPEED & SCALE

Integrity matters

There's another more insidious problem plaguing carbon removal: an absence of guardrails. For too long, companies have dodged responsibility by undercounting their emissions and overstating the impact of their offsets.

In an aptly titled 2023 landmark report, "Integrity Matters," the United Nations defined net zero in real-world terms.⁵³ Here's what it said: Net zero is achieved when residual emissions—the greenhouse gases left over after a company cuts all it can—are fully negated by permanent removals.

The UN definition covers all scopes of emissions, from a company's operations to its supply and value chains. And it covers all greenhouse gases, including methane. In addition, legitimate removal efforts must keep carbon out of the atmosphere for the long haul, ideally for tens of thousands of years. Until emitters abide by the UN's standards, with third-party verification of carbon removal claims, a true picture of world progress will be elusive.

The limits of offsets

With voluntary carbon markets exploding, it's important to assess the value of carbon offsets. There are three basic flavors of offsets: reduction, protection, and removal. Reduction projects are broadly linked to renewable energy deployment. Protection projects help preserve forests and oceans. But for companies to truly offset their emissions, neither reduction nor protection efforts can be factored in. To fulfill a commitment to reach net zero, they must remove leftover emissions—permanently.

In this light, Speed & Scale is calling for a radical expansion of investment in carbon removal to \$20 billion per year by 2030. **Achieving our net zero target demands both immediate emissions cuts and down-the-road removal.**

The idea is to get ahead of the curve, to invest now for what the world will need later.





Win Politics and Policy

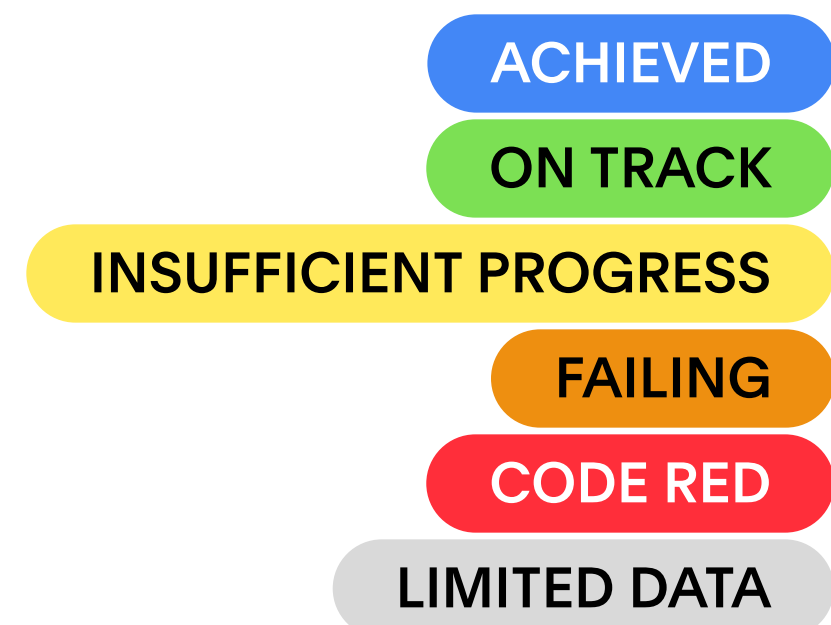
7.0

Not nearly enough global action.

Back in 2019, four years after the Paris Agreement, only the European Union had a net zero pledge in place. Today, net zero targets have been declared by all five top emitters: China, the U.S., the European Union, India, and Russia (though Russia's commitment seems dubious, at best).⁵⁴

As a result, a flurry of high-impact policies have been enacted:

- In 2020, the European Green Deal paved the way for a substantial tax on carbon-intensive imports.⁵⁵
- In 2021, China, the world's largest emitter, imposed an emissions trading system on its power sector.⁵⁶
- In 2022, the U.S. enacted the Inflation Reduction Act. It could channel over \$1 trillion⁵⁷ in government spending to accelerate the transition to net zero.



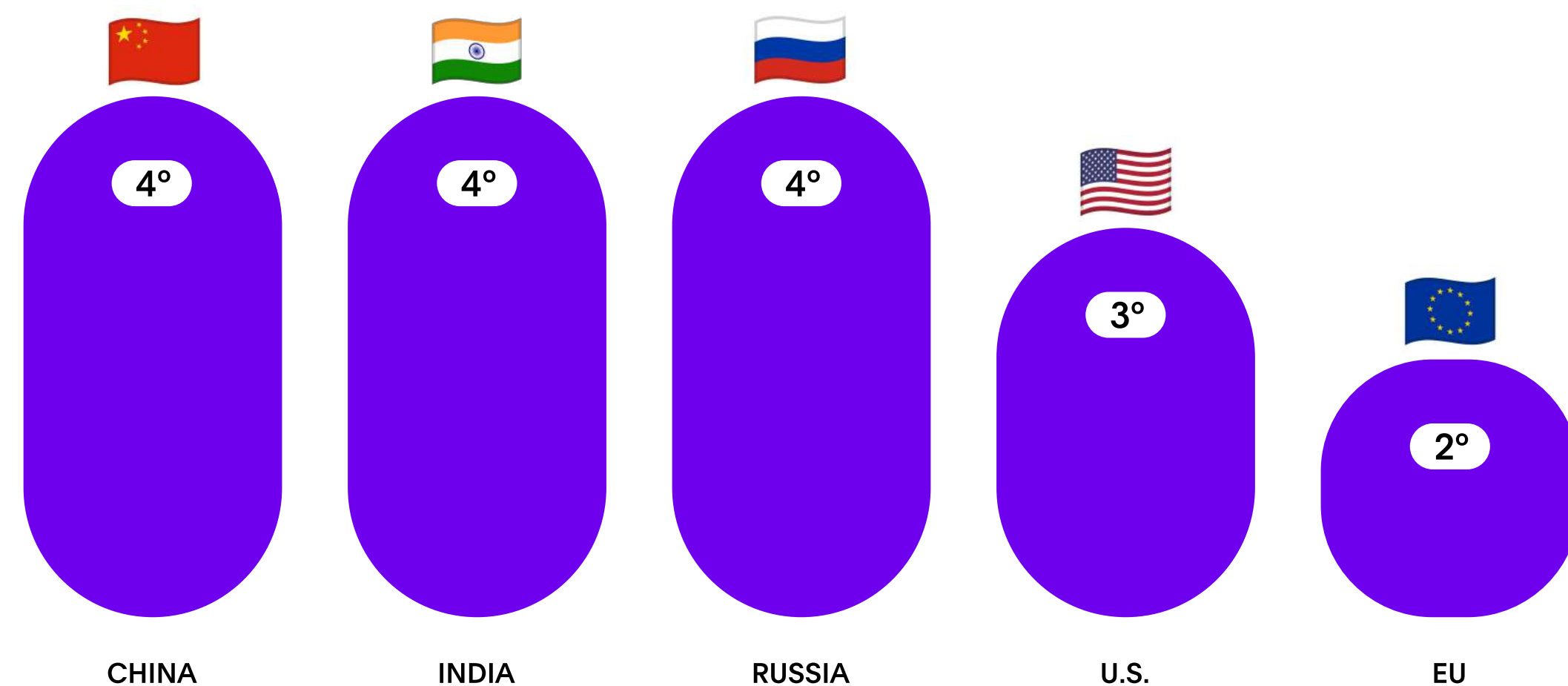
Off track for net zero

Yet despite this historic progress, the world is still off course for net zero. The top emitters are behind schedule in meeting their near-term emissions reduction milestones. While some are further along than others, most are not even close.

To preserve a livable planet, countries need to take more aggressive climate action. The world cannot get to net zero unless governments adopt bolder policies to phase out fossil fuels, from transformational legislation to stringent emissions standards for power plants, vehicles, buildings, and factories. The question then becomes: Which policies might have the greatest impact?

The top five emitters are all off track

Projected global temperature increases based on 2030 pathways



SOURCE: CLIMATE ACTION TRACKER, 2023

Global fossil fuel subsidies reach record high

Explicit fossil fuel subsidies



SOURCE: IMF, 2023

Sunseting handouts for fossil fuels

To boost wind and solar, it is imperative to end the \$1 trillion-plus in explicit annual global fossil fuel subsidies, an all-time high spurred by Russia's invasion of Ukraine.⁵⁸ Weaning the world off these subsidies will be tough and complex work. And as they phase out these backward-looking incentives, countries must also guarantee that cheap, clean energy is made available to all.

A (meaningful) price on carbon

A price or tax on carbon has gained traction in many parts of the world, from Europe to China. Even amid the polarized, rough-and-tumble politics in the U.S., California and several other states have forged ahead.⁵⁹ As of 2023, 23 percent of global carbon emissions were covered by carbon pricing policies, up from 13 percent in 2019.⁶⁰ That's indisputable progress.

It should be acknowledged, however, that most carbon prices are too low and too narrowly applied to move the needle on emissions cuts.

To be effective, the price must be high enough to tip the economics in favor of clean alternatives. For advanced economies, Speed & Scale calls for a minimum price of \$75 a ton, rising by 5 percent each year. To make the right outcome for climate the probable outcome, it needs to become the more profitable outcome. A meaningful tax on carbon can speed that development.

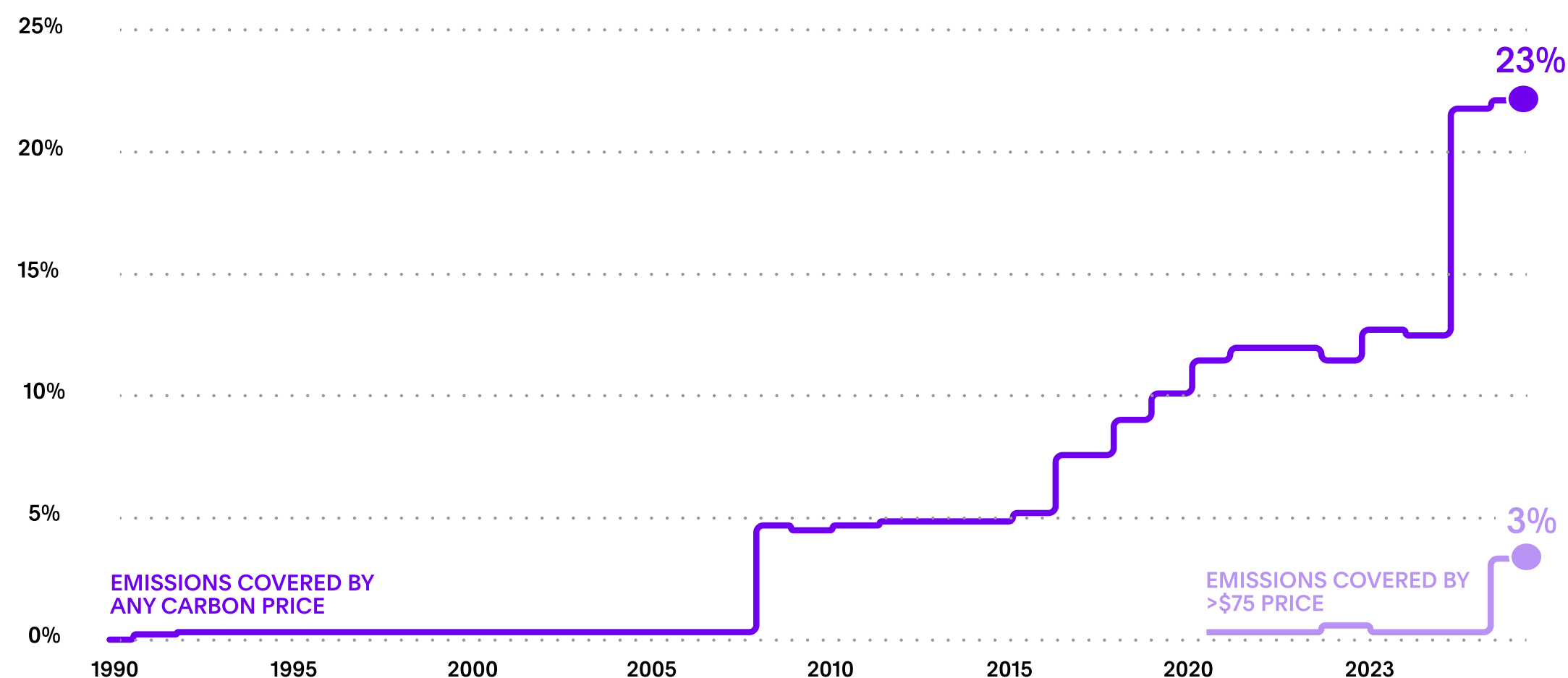
Mitigating methane

Pound for pound, methane packs 80 times more global-warming punch than carbon dioxide.⁶¹ In 2021, at COP26, more than 100 countries signed on to a Global Methane Pledge to cut methane emissions by 30 percent by 2030. At COP28 in Dubai, 50 oil and gas companies—representing 40 percent of global production—committed to drive methane emissions to “near zero” by the same deadline.⁶² With methane emissions still rising, more ambitious pledges are in order. Plus we need holdout countries and companies to get on board. Solutions to eliminate the bulk of these emissions already exist, and should be implemented immediately.

From lost homes to lost jobs to an appalling loss of life, climate-linked weather events are devastating millions of people each year. Policymakers around the globe must step up with prompt national action and unprecedented cooperation.

Carbon pricing is taking off

Percentage of global emissions covered by carbon pricing



SOURCE: WORLD BANK, 2023





Turn Movements Into Action

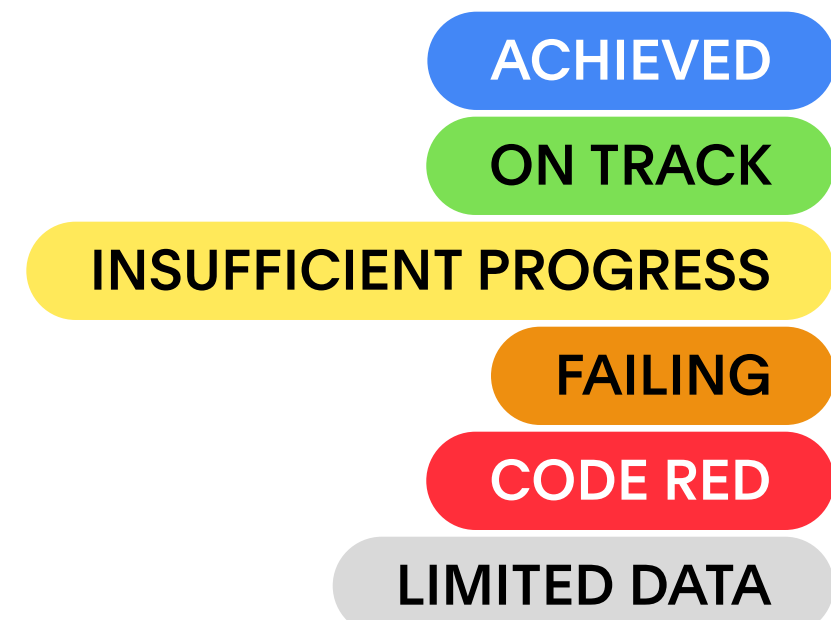
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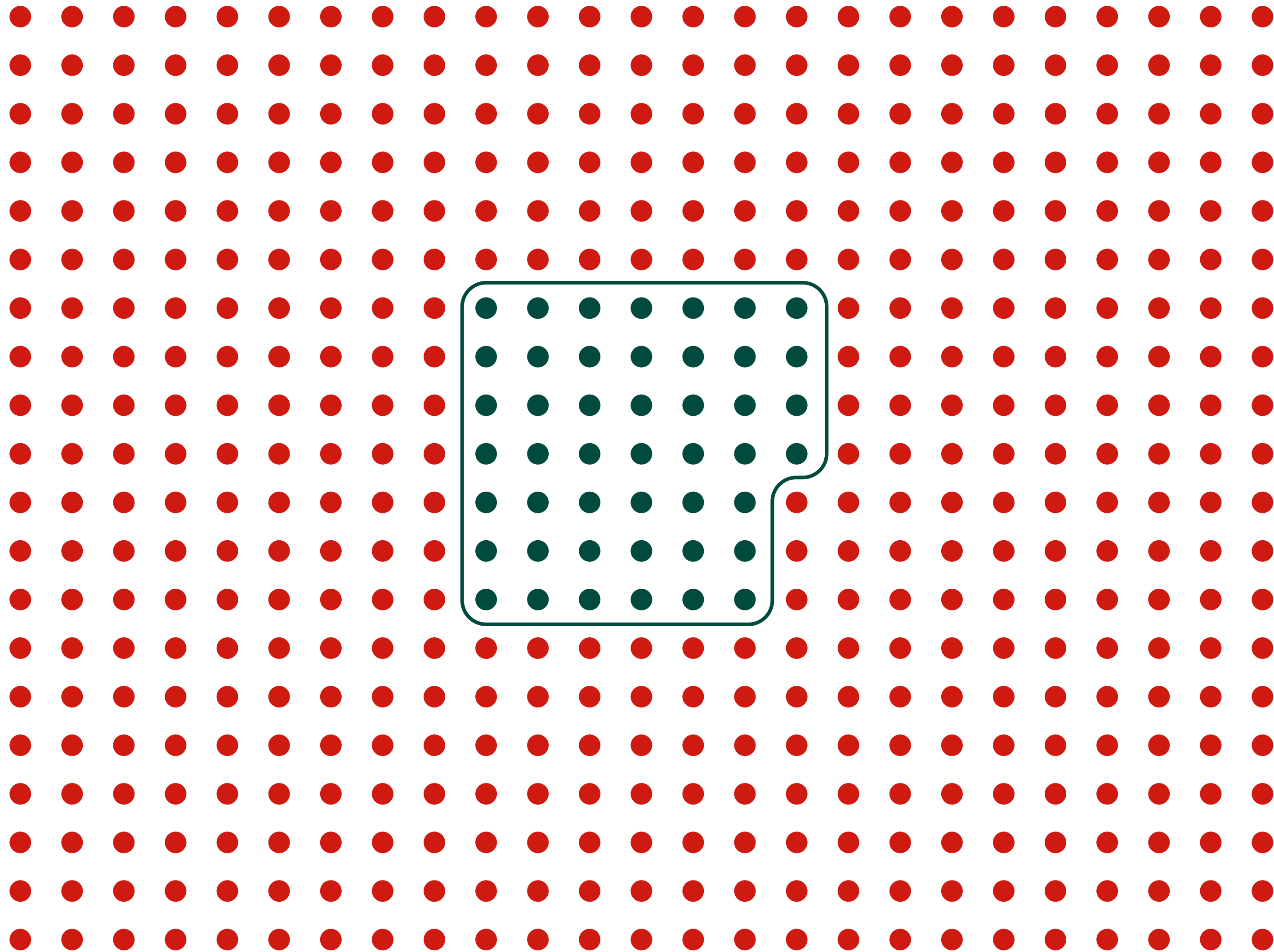
An existential crisis demands bolder collective action.

Just a few years ago, as climate movements surged, hope sprang. Shareholder activists were pushing Big Oil to steer away from fossil fuels and diversify into renewable energy. Major corporations began making net zero pledges. A consortium of top financial institutions, representing \$130 trillion of capital,⁶³ joined an alliance to support net zero.

Then things changed. Beset by high interest rates, stubborn inflation, and aggressive backlash from the fossil fuel camp, private-sector climate leaders retreated.

BlackRock closed ESG funds.⁶⁴ Vanguard left the net zero financial alliance.⁶⁵ Three Exxon directors, elected to chart a low-carbon future, wound up voting with management to double down on fossil fuels. Perhaps most disheartening, corporate net zero commitments stalled. Today, less than 10 percent of the Fortune Global 500 has a net zero commitment in place.⁶⁶





Only 9% of the Fortune Global 500—46 companies—have net zero targets.

SOURCE: SPEED & SCALE ANALYSIS; FORTUNE GLOBAL 500

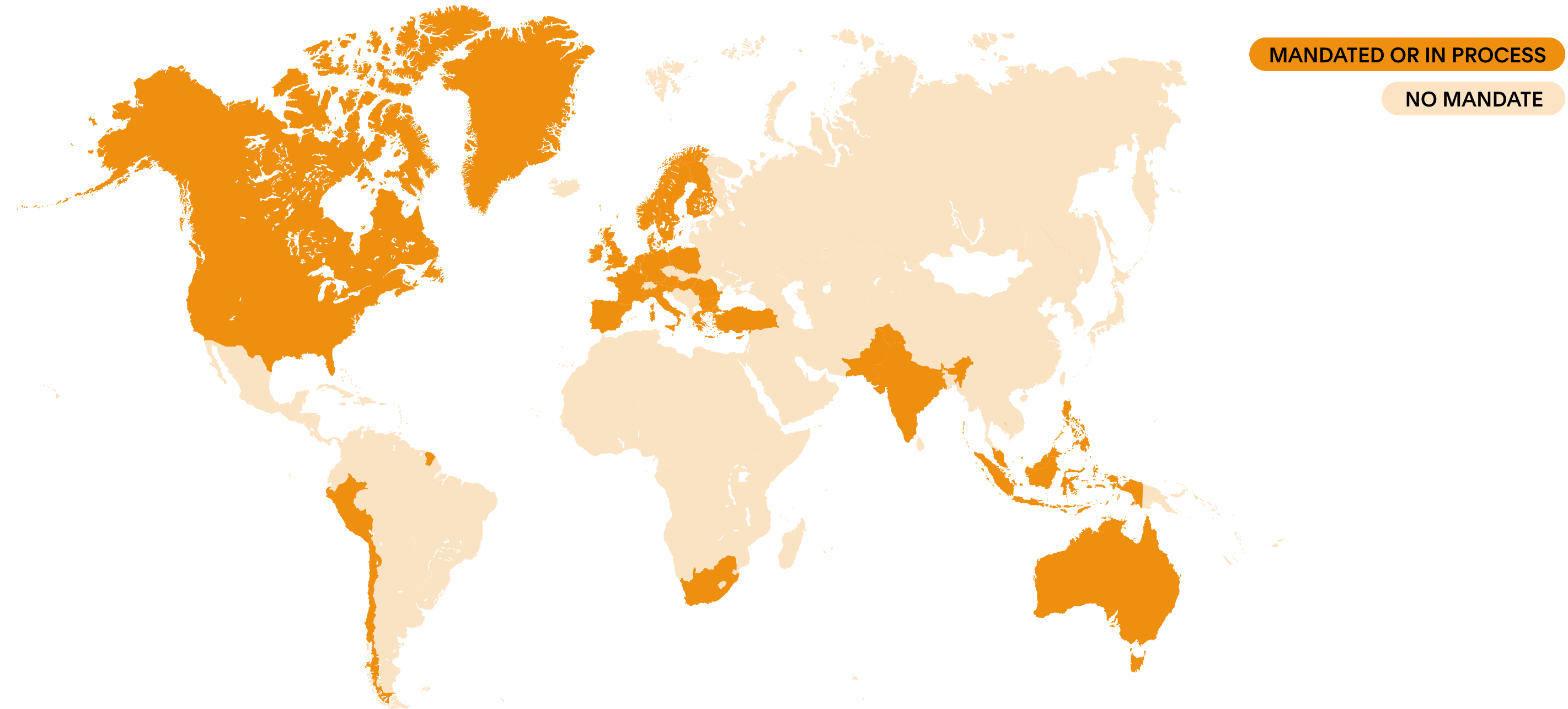
Hope on the horizon

Progress isn't always linear. In these trying times, it's important to remember that movements can still change the world. In the life-and-death drive to net zero, they are playing a huge role:

- Movements are triggering government action. Voluntary reporting by more than 20,000⁶⁷ companies catalyzed mandatory emissions reporting around the world.
- Movements are shrinking the green premium. Early purchasing by Google,⁶⁸ Ikea,⁶⁹ and a number of corporate consortiums helped to lower prices of renewables for all.
- Movements are decarbonizing at scale. An unprecedented coalition of government, multinationals, and nonprofits worked together to stop environmental destruction in Indonesia. In the same spirit, shareholders and employees need to demand action and push companies to meet net zero goals.

ESG disclosure regulations are being widely adopted

Sustainability reporting by corporations



SOURCE: SWISS FINANCE INSTITUTE, 2023

Movements can still change the world. In the life-and-death drive to net zero, they have a huge role to play.

What can voters do?

The impacts of climate change link directly to everyday economic issues for families worldwide: jobs, inflation, migration, and healthcare. In other words, climate change will define just about everyone's quality of life for the foreseeable future. In response, it's up to voters to demand accountability and urgent action. Public perception of climate change has come a long way. In opinion polls, it now consistently ranks among the top 10 global issues. It needs to rank among the top three.

In short, climate needs to become an everyday, in-your-face issue about a cleaner, healthier, fairer, and more prosperous future.

The goal is to galvanize people to make their voices heard at the polls and in the halls of government. An engaged public drives government, which drives business and change.

The impact of climate change links directly to everyday economic issues for families worldwide: jobs, inflation, migration, and healthcare. In other words, climate change will define just about everyone's quality of life for the foreseeable future.

Concern over climate has grown—slowly

Public ranking of issues that are most worrying to the world

2014

1. UNEMPLOYMENT
2. POVERTY AND SOCIAL INEQUALITY
3. FINANCIAL / POLITICAL CORRUPTION
4. CRIME AND VIOLENCE
5. HEALTHCARE
6. TAXES
7. EDUCATION
8. MORAL DECLINE
9. INFLATION
10. IMMIGRATION CONTROL
11. MAINTAINING SOCIAL PROGRAMS
12. THREATS AGAINST THE ENVIRONMENT
13. RISE OF EXTREMISM
14. **CLIMATE CHANGE**
15. TERRORISM

2023

1. INFLATION
2. POVERTY AND SOCIAL INEQUALITY
3. CRIME AND VIOLENCE
4. UNEMPLOYMENT
5. FINANCIAL / POLITICAL CORRUPTION
6. HEALTHCARE
7. **CLIMATE CHANGE**
8. TAXES
9. IMMIGRATION CONTROL
10. EDUCATION
11. MORAL DECLINE
12. MILITARY CONFLICT BETWEEN NATIONS
13. THREATS AGAINST THE ENVIRONMENT
14. RISE OF EXTREMISM
15. TERRORISM

SOURCE: IPSOS, SUMMER 2023



Innovate!

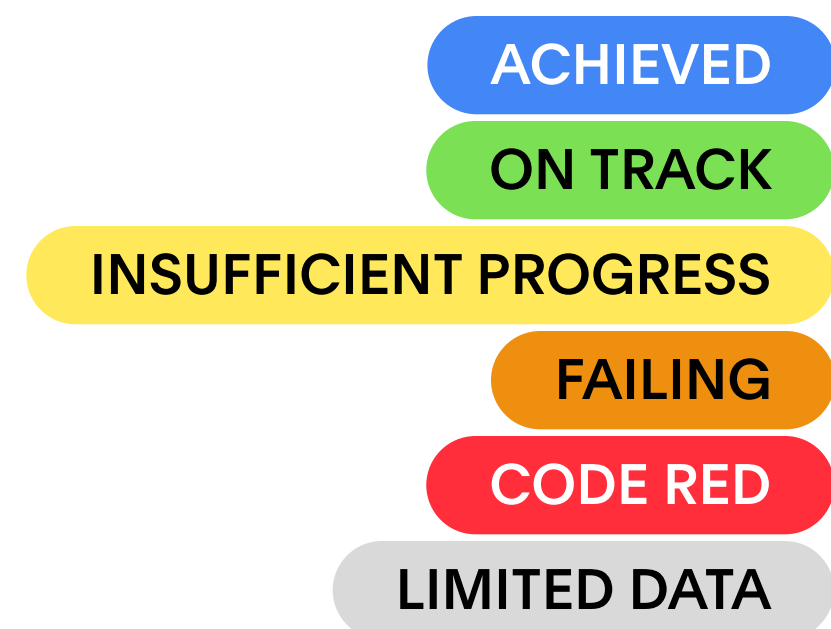
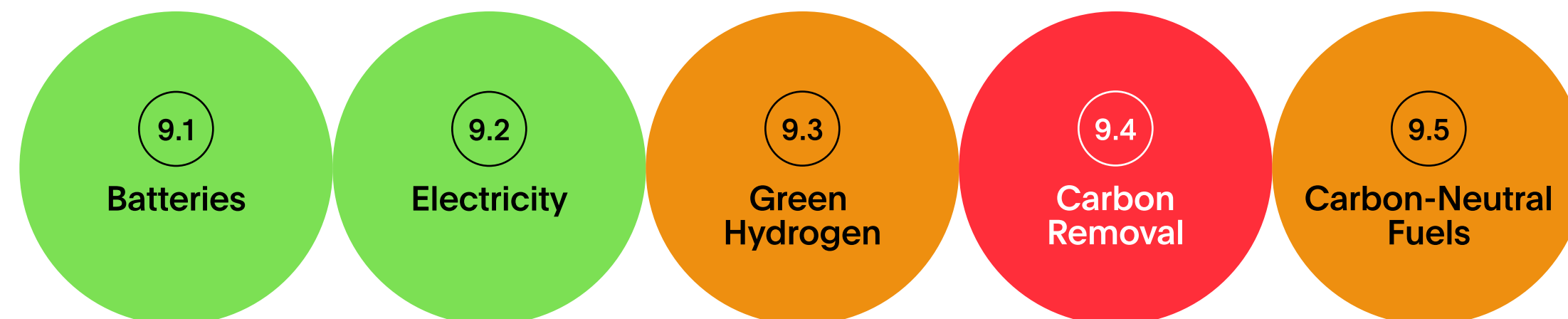
9.0

We're doing better on "the now" than "the new"

Too often, the debate over net zero pits policy against innovation. One camp says the world has all the tech it needs; all that's missing is stronger policy to unleash it.

The other says our target can't be reached without the next wave of breakthroughs.

The reality is more complex—and more challenging. In fact, we must do two things at once. **We need to scale existing solutions today and invent the ones we'll need tomorrow.** We need both the now and the new.



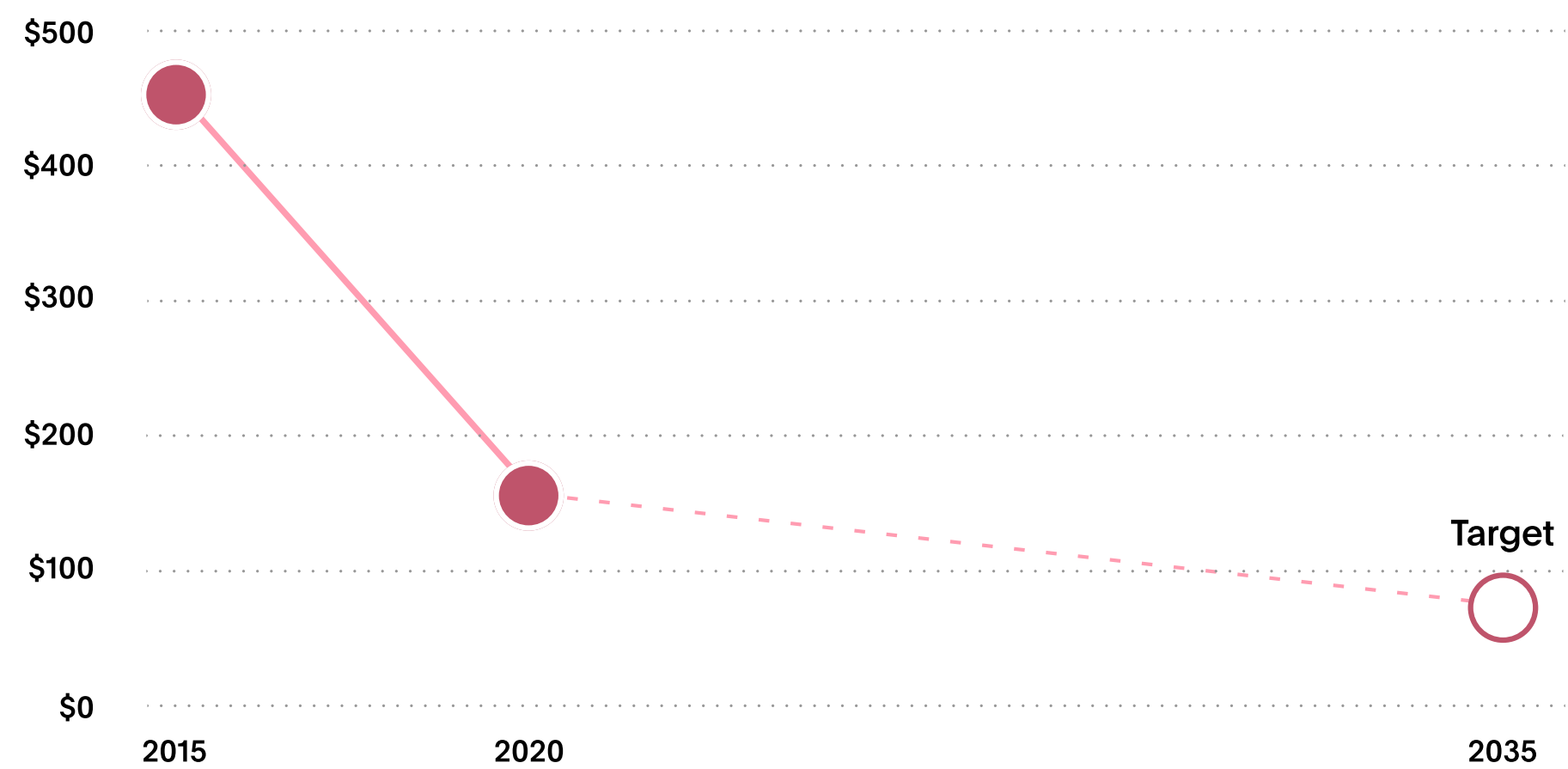
The now

Two areas making dramatic advances are batteries and zero-emissions electricity. Between 2019 and 2023, the price of batteries fell by about 25 percent, as production rose by almost a factor of five.⁷⁰ Over roughly the same period, the price of solar dropped by nearly 30 percent and the price of wind by around 40 percent.⁷¹ Both are on track to hit Speed & Scale’s net zero-aligned targets.

Between 2019 and 2023, the price of batteries fell by about 25 percent, as production rose by nearly a factor of five.

We’re on track to hit our battery price targets

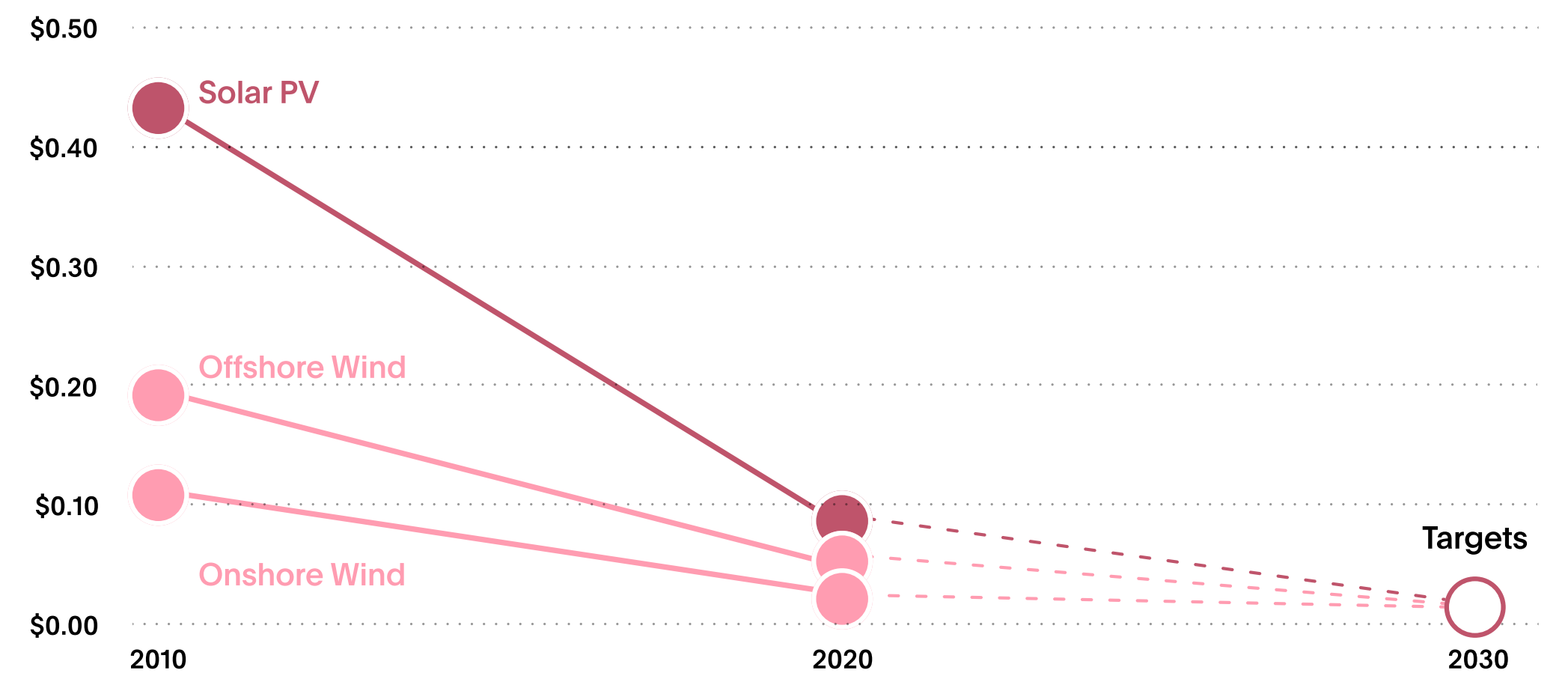
Price per kilowatt-hour



SOURCE: BLOOMBERGNEF, 2023

Renewables prices are on track as well

Price per kilowatt-hour



SOURCE: IRENA, 2023

The new

Green hydrogen, carbon removal, and carbon-free fuels are among the next-generation innovations presently held back by high costs. For success as they move from lab to market, sustained investment will be essential.

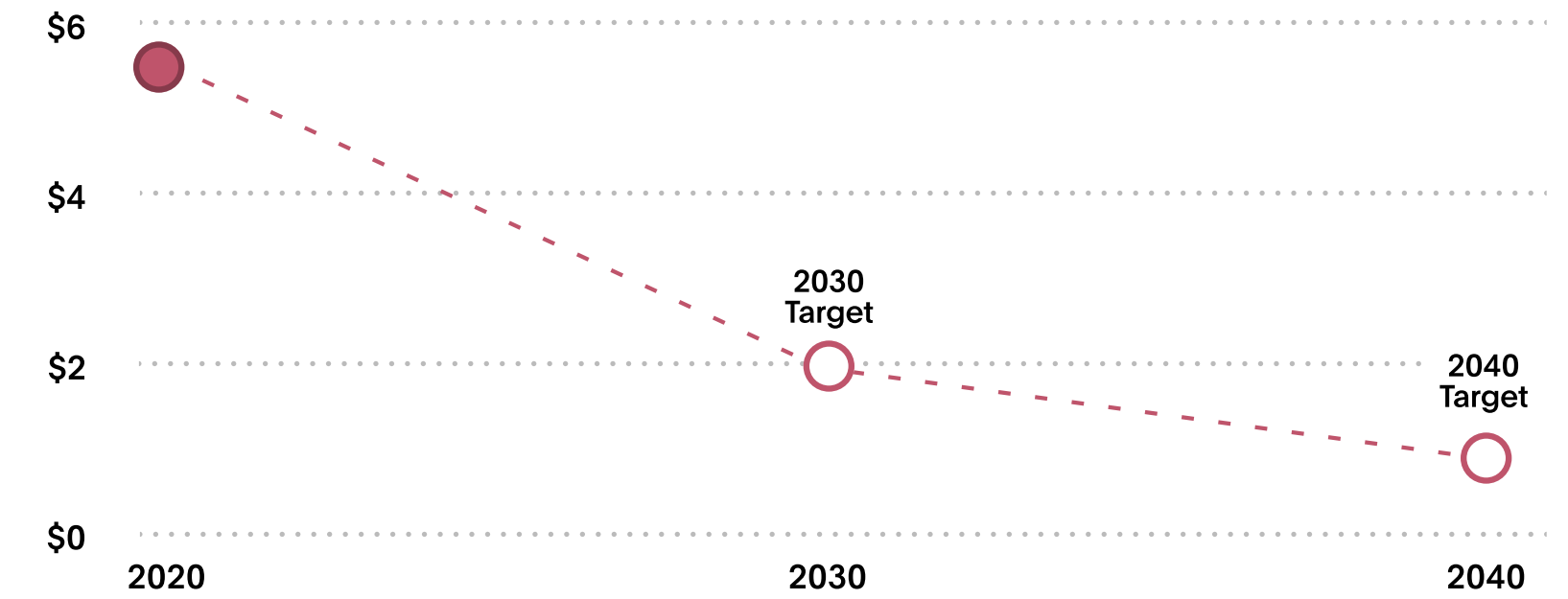
The platform for net zero is a three-legged stool: cut emissions, conserve energy, and remove carbon. **Technologies must be scaled for all three, now and in the future.**

The “green premium” needs to become a “green discount,” the point where clean energy and applications become cheaper than their fossil fuel counterparts. Aggressive policy can push financial incentives in the right direction. But fledgling technologies also need bold investors to help them bridge the gap between R&D and deployment. For cleantech to flourish, it must scale before it becomes cost-competitive.

Green hydrogen needs to come down in price

Average dollars per kilogram

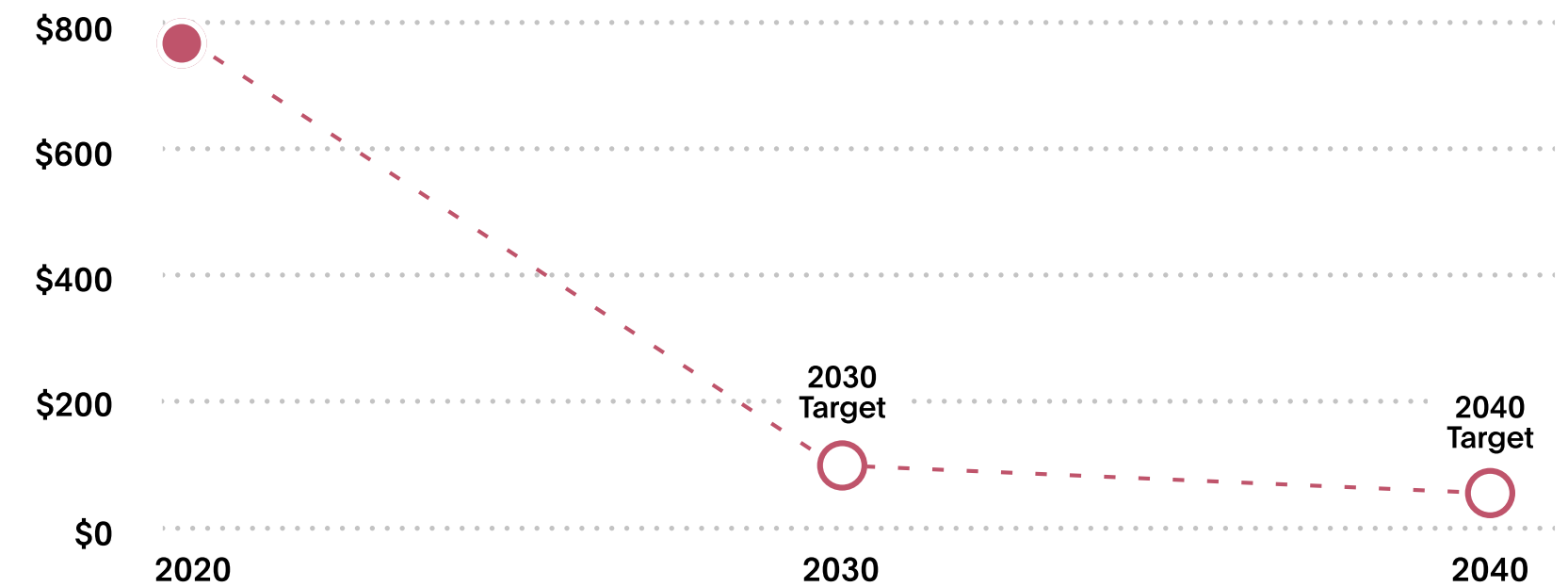
SOURCE: BLOOMBERGNEF, 2023



Carbon removal needs to scale and get cheaper

Average dollars per ton

SOURCE: CDR.FYI, 2023

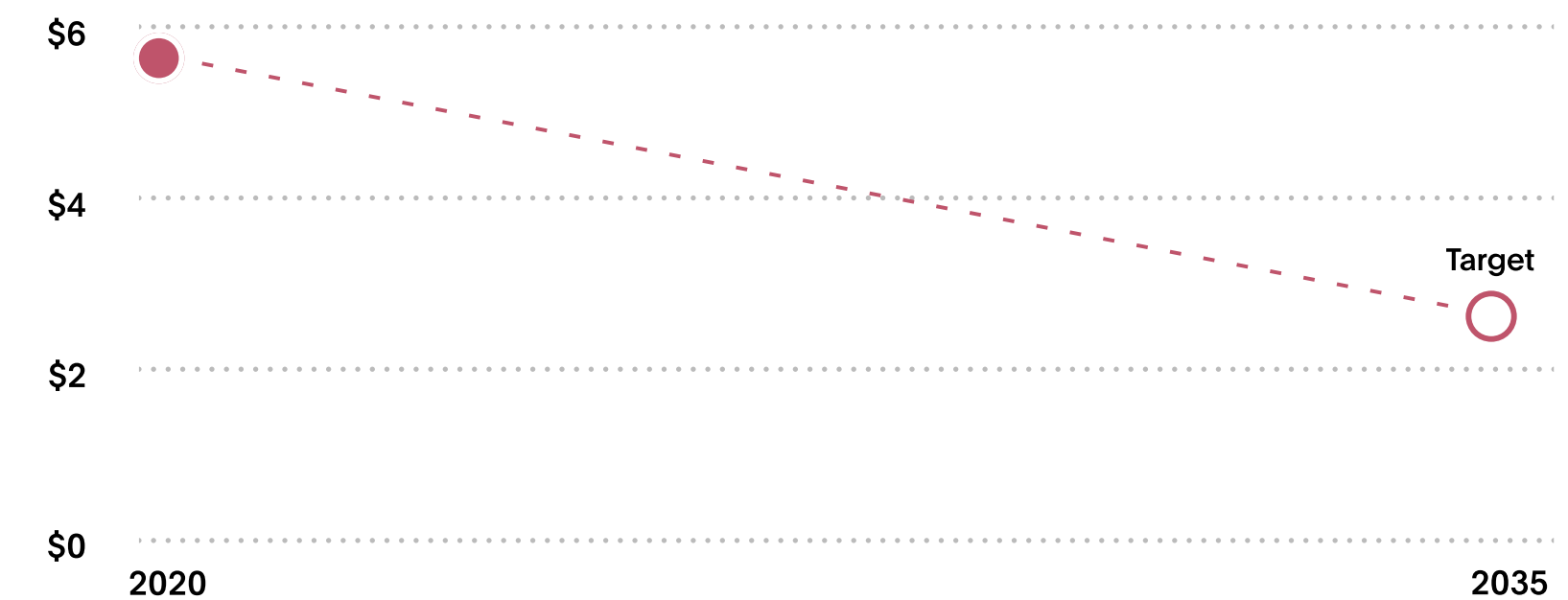


Sustainable Aviation Fuel (SAF) is pricey, too

Average dollars per gallon

SOURCE: BLOOMBERGNEF, IATA, 2023

NOTE: CALCULATED USING SAF PRICE MULTIPLE



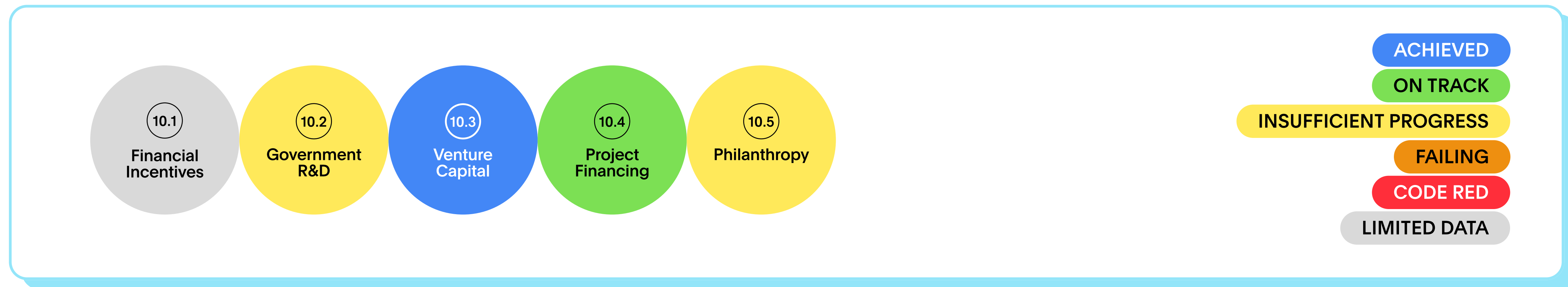
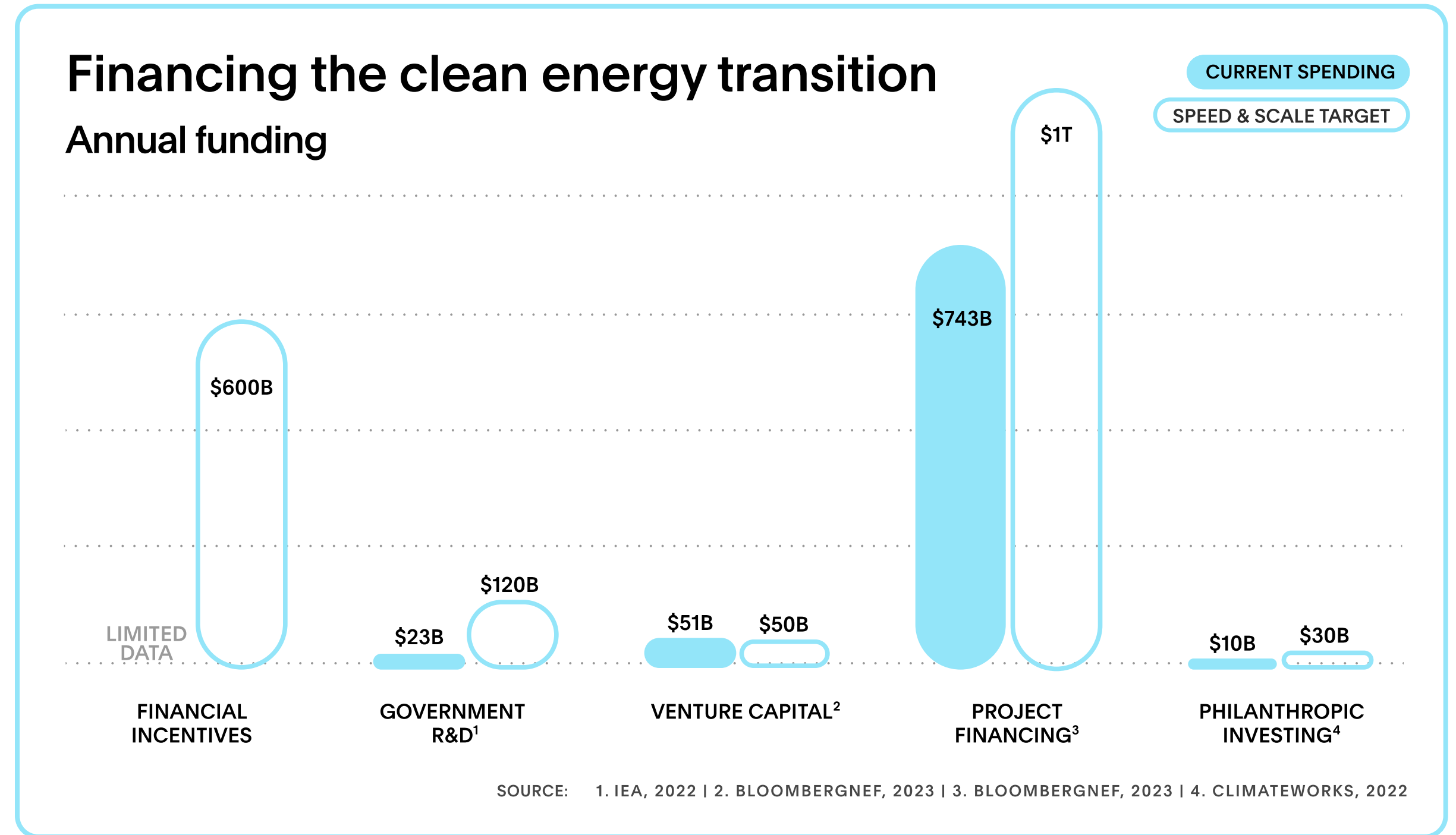


Invest!

10.0

The funding faucets for clean energy have opened; let's make sure they don't freeze.

Investment is an essential accelerant for the clean energy transition. The last four years have seen encouraging growth in two key areas of cleantech funding. The world is now investing close to \$800 billion annually in project financing and venture capital combined, a 75 percent jump from 2019.⁷² Despite headwinds from high inflation and rising interest rates, funders have stepped in and stepped up.



Large-scale projects

In channeling vital dollars to new solar and wind facilities and other capital-intensive projects, project financing is the largest source of cleantech funding by far. From 2019 to 2023, it nearly doubled, from \$393 billion to a record \$743 billion.⁷³ That's tremendous progress, yet it needs to accelerate to reach Speed & Scale's \$1 trillion target by 2025.

Project financing is even more critical to decarbonize emerging economies, which are widely hamstrung by higher borrowing costs. To help prevent these countries from getting locked into dirty fuels, the World Bank is now devoting 45 percent of its funding to climate-related projects—a giant step forward.⁷⁴ Other banks should follow its lead.



Government partnership

Financial incentives are the government dollars that make cleaner alternatives cheaper.

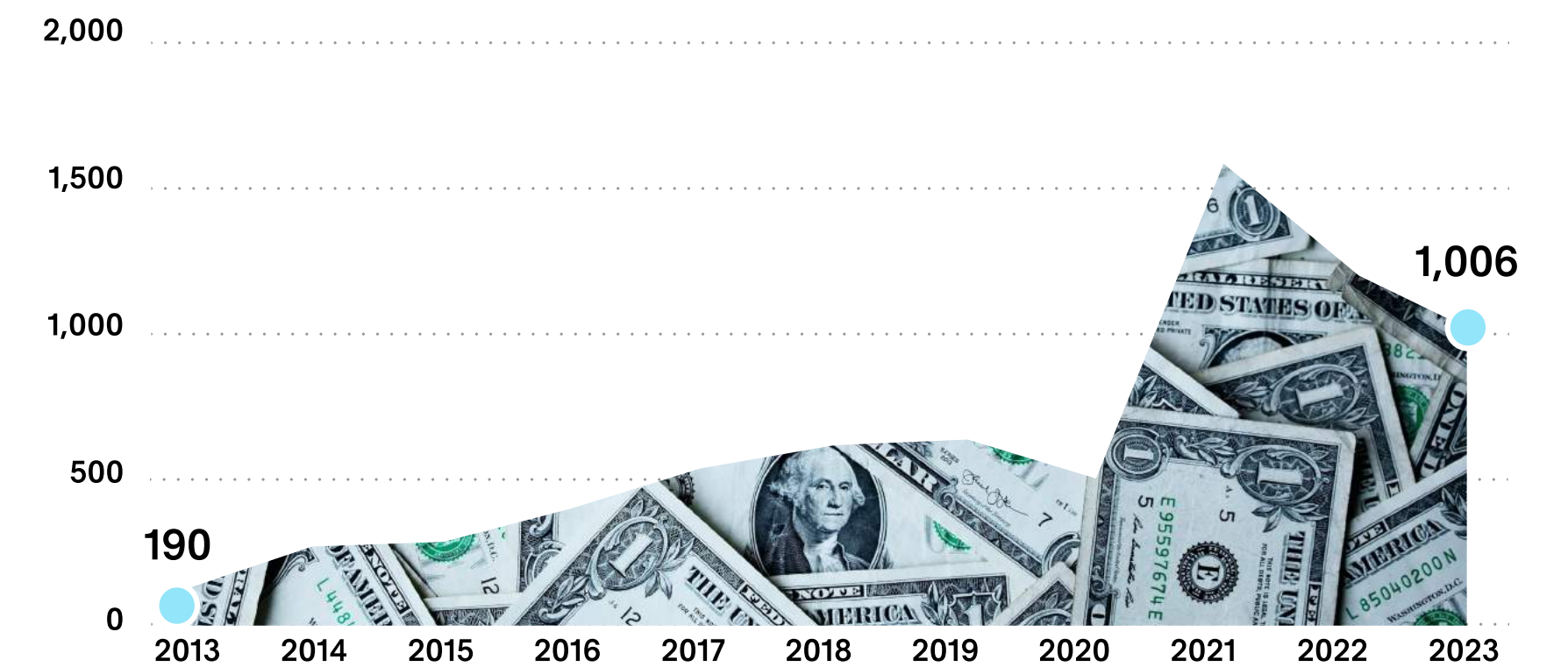
In 2022, the U.S. took an enormous step with the Inflation Reduction Act, which could distribute more than \$1 trillion over 10 years.⁷⁵ Close to 300 clean energy projects across 44 states have already been announced. They're expected to create nearly 175,000 jobs.⁷⁶

Venturing forth

Venture capital, which invests in startups and other early-stage companies, is making record progress on the climate front. It's the one Speed & Scale milestone already achieved in full. In 2021, 2022, and 2023, venture funding for climate tech surpassed the annual target of \$50 billion per year.⁷⁷ By backing close to 3,000 companies over the last five years, venture dollars have created a dynamic climate tech environment.

More climate startups are raising capital

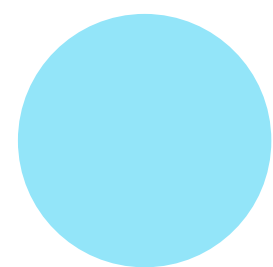
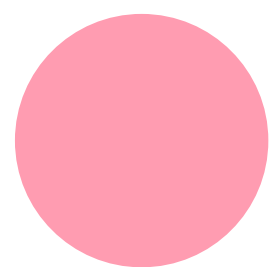
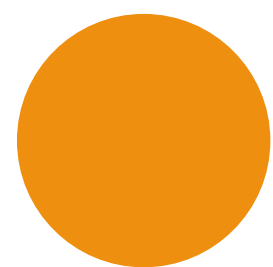
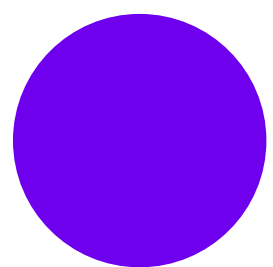
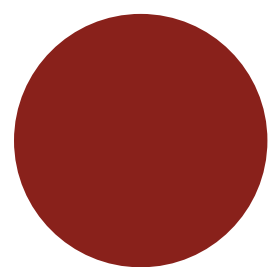
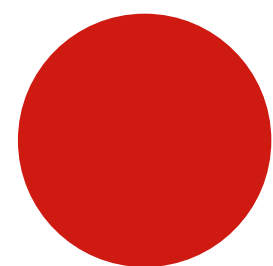
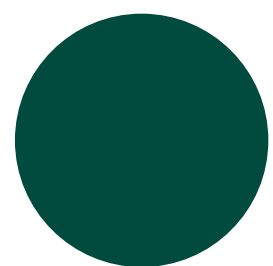
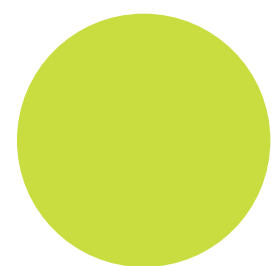
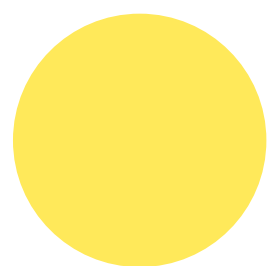
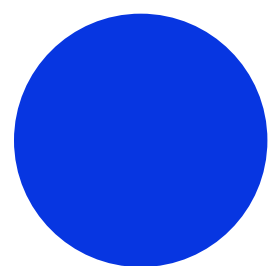
Number of venture capital deals



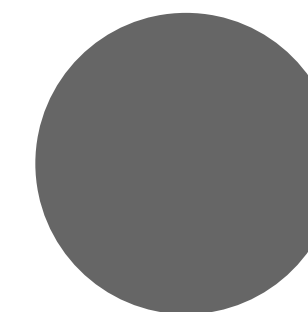
SOURCE: BLOOMBERGNEF, 2024

In a tougher economic period, however, cleantech startups will need to do more with less. The bar for operating excellence will be even higher for follow-on financing.

The transition to a clean energy future is the great economic opportunity of our lifetimes. It will yield millions of new jobs — as well as clean air and healthier lives—in every corner of the planet. Humanity was gifted with a rich ecosystem. It is well worth the investment to save it.



In Sum



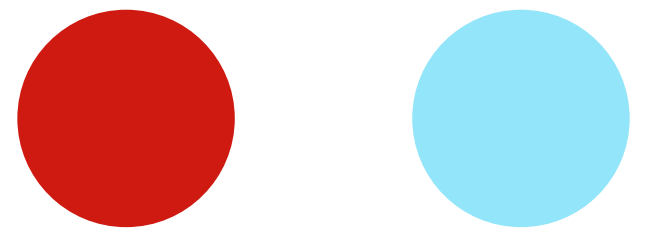
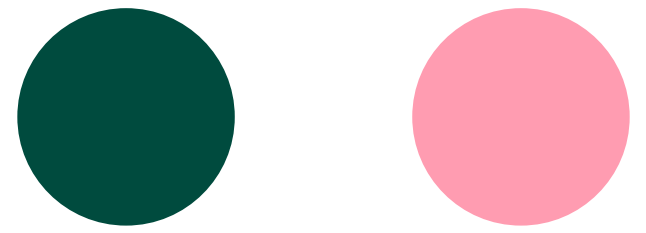
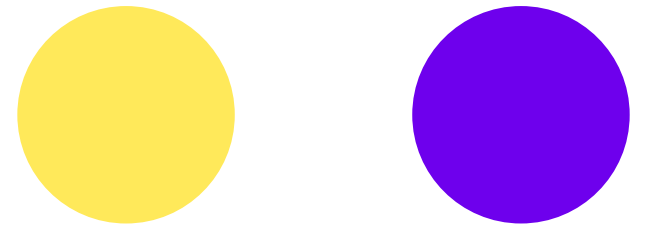
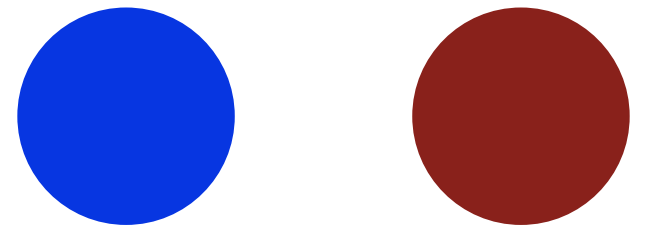
At first glance, the 2024 Speed & Scale tracker update is not a pretty picture. For the most part, our key results are submerged in a sea of orange and red, signposts of impending failure.

Yet far more progress has been made than the doom-and-gloom crowd will acknowledge—in the adoption of EVs, the deployment of bargain-priced renewables, the funding of climate startups to incubate innovation. And, not least, in having the five top emitters—including the U.S. and China—commit to a net zero future.

The final story of climate progress has yet to be written. The world has the technology it needs to cut emissions by half by the end of this decade. What's needed is the requisite speed and scale—and the grit to phase out fossil fuels—to get to the net zero finish line in time.

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In 2024, more than 2 billion people will vote in national elections with profound implications for the climate.⁷⁸ Well ahead of COP30 in 2025, as nations declare new pledges to cut emissions, they must adopt more aggressive policies to confront the carbon dinosaur in the room.

In short, this may be humanity's last best chance to save a habitable planet. It's up to us—to all of us—to seize it.

Citations

- <https://www.unep.org/emissions-gap-report-2020>
- <https://www.climate.gov/news-features/featured-images/2023-was-warmest-year-modern-temperature-record>
- <https://www.unep.org/resources/emissions-gap-report-2023>
- <https://www.bnef.com/flagships/ev-outlook>
- <https://www.bnef.com/insights/32967>
- <https://www.iea.org/news/massive-expansion-of-renewable-power-opens-door-to-achieving-global-tripling-goal-set-at-cop28>
- <https://www.bnef.com/insights/31433>
- <https://www.weforum.org/publications/net-zero-industry-tracker-2023/>
- <https://www.unep.org/resources/production-gap-report-2023>
- <https://www.edf.org/climate/methane-crucial-opportunity-climate-fight>
- https://climateactiontracker.org/documents/1187/CAT_2023-12-05_GlobalUpdate_COP28.pdf
- <https://www.bnef.com/insights/33697>
- <https://www.notateslaapp.com/tesla-reference/1350/tesla-s-original-roadster-price-specs-and-range-of-the-vehicle-that-sparked-the-electric-revolution>
- <https://www.reuters.com/business/autos-transportation/tesla-slashes-prices-model-3-models-y-vehicles-us-2023-10-06/>
- <https://carnewschina.com/2023/07/03/byd-seagull-sales-in-june-2023/>
- <https://www.economist.com/leaders/2024/01/11/an-influx-of-chinese-cars-is-terrifying-the-west>
- <https://www.bloomberg.com/news/articles/2023-09-14/from-cheap-money-to-tax-breaks-evs-in-china-get-a-lot-of-love> & <https://chinadialogue.net/en/business/life-after-subsidies-for-chinas-evs/#:~:text=More%20than%20200%20billion%20yuan,support%20and%20subsidies%20have%20declined.>
- <https://chineseclimatepolicy.oxfordenergy.org/book-content/domestic-policies/vehicles/electric-vehicles/>
- <https://chineseclimatepolicy.oxfordenergy.org/book-content/domestic-policies/vehicles/electric-vehicles/>
- <https://www.bloomberg.com/news/articles/2022-09-20/more-than-half-of-us-car-sales-will-be-electric-by-2030>
- <https://www.wsj.com/articles/ford-projects-3-billion-loss-on-ev-business-for-2023-98037e4e>
- <https://www.bnef.com/login?r=%2Finsights%2F33697%2Fview%3F%3DBNEF%2520Series%253Asailthru>
- <https://assets.bbhub.io/professional/sites/24/2023-COP28-ZEV-Factbook.pdf>
- <https://www.statista.com/chart/30890/estimated-share-of-co2-emissions-in-the-transportation-sector/>
- <https://www.energyinst.org/statistical-review>
- <https://www.iea.org/reports/world-energy-outlook-2023>
- <https://eneroutlook.enerdata.net/forecast-world-electricity-consumption.html>
- <https://ember-climate.org/insights/research/global-electricity-review-2023/>
- <https://www.iea.org/reports/world-energy-outlook-2023>
- https://repeatproject.org/docs/REPEAT_IRA_Transmission_2022-09-22.pdf
- <https://www.eia.gov/todayinenergy/detail.php?id=60663>
- <https://beyondfossilfuels.org/gas/>
- <https://www.reuters.com/business/energy/europes-energy-crisis-is-over-kemp-2023-11-28/>
- https://climatetrace.org/inventory?sector=agriculture&year_from=2022&year_to=2022&gas=co2e100
- https://climatetrace.org/inventory?sector=agriculture&year_from=2022&year_to=2022&gas=co2e100 and <https://www.fao.org/faostat/en/#data/GT>
- <https://www.economist.com/science-and-technology/2023/12/12/will-lab-grown-meat-ever-make-it-onto-supermarket-shelves>
- <https://www.bnef.com/insights/31433>
- <https://www.marknteladvisors.com/research-library/plant-based-dairy-market.html>
- <https://www.theguardian.com/world/2023/nov/09/canada-wildfire-record-climate-crisis>
- <https://www.ecosystemmarketplace.com/articles/new-state-of-the-voluntary-carbon-markets-2023-finds-vc-m-demand-concentrating-around-pricier-high-integrity-credits/>
- <https://www.reuters.com/world/americas/deforestation-brazils-amazon-down-by-50-five-year-low-2023-2024-01-12/>
- <https://research.wri.org/gfr/latest-analysis-deforestation-trends>
- <https://www.wsj.com/world/china/chinas-metal-demand-takes-a-different-shape-640953b7>
- <https://www.sciencedirect.com/science/article/pii/S0921344920304249#fig0002>, <https://worldsteel.org/wp-content/uploads/World-Steel-in-Figures-2023-4.pdf>, https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroBy2050-ARoadmapfortheGlobalEnergySector_CORR.pdf, and <https://www.statista.com/statistics/1087115/global-cement-production-volume/>
- <https://www.industrytransition.org/green-steel-tracker/> and <https://www.bnef.com/insights/33187>
- <https://www.bnef.com/insights/33187>
- <https://worldsteel.org/media/press-releases/2024/december-2023-crude-steel-production-and-2023-global-totals/>
- https://www3.weforum.org/docs/WEF_Net_Zero_Tracker_2023_REPORT.pdf
- <https://www.sightlineclimate.com/>
- <https://missionpossiblepartnership.org/action-sectors/steel/>
- <https://www.wri.org/initiatives/carbon-removal>
- [CDR.fyi](#)
- https://www.un.org/sites/un2.un.org/files/high-level_expert_group_n7b.pdf
- <https://climateactiontracker.org/>
- https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
- <https://www.csis.org/analysis/chinas-new-national-carbon-trading-market-between-promise-and-pessimism>
- <https://www.goldmansachs.com/intelligence/pages/the-us-is-poised-for-an-energy-revolution.html>
- <https://www.imf.org/en/Topics/climate-change/energy-subsidies>
- <https://www.c2es.org/document/us-state-carbon-pricing-policies/>
- <https://carbonpricingdashboard.worldbank.org/>
- <https://www.unep.org/explore-topics/energy/facts-about-methane>
- <https://www.iea.org/reports/global-methane-tracker-2024/what-did-cop28-mean-for-methane>
- <https://www.gfanzero.com/press/amount-of-finance-committed-to-achieving-1-5c-now-at-scale-needed-to-deliver-the-transition/>
- <https://www.bloomberg.com/news/articles/2023-09-21/blackrock-state-street-among-money-managers-closing-esg-funds>
- <https://www.bloomberg.com/news/articles/2022-12-07/vanguard-quits-net-zero-alliance-marking-biggest-defection-yet>
- [Speed & Scale Analysis](#) and <https://fortune.com/ranking/global500/>
- <https://www.cdp.net/en/companies/cdp-2023-disclosure-data-factsheet>
- <https://static.googleusercontent.com/media/www.google.com/en//green/pdf/achieving-100-renewable-energy-purchasing-goal.pdf>
- <https://www.ikea.com/global/en/our-business/people-planet/renewable-electricity/>
- <https://www.bnef.com/insights/32781>
- <https://www.irena.org/Publications/2023/Aug/Renewable-Power-Generation-Costs-in-2022>
- <https://www.bnef.com/insights/31433> and <https://www.bnef.com/interactive-datasets/2d5d59acd9000005?data-hub=3>
- <https://www.bnef.com/interactive-datasets/2d5d59acd9000005?data-hub=3>
- <https://www.worldbank.org/en/news/press-release/2023/12/01/world-bank-group-doubles-down-on-financial-ambition-to-drive-climate-action-and-build-resilience>
- <https://www.goldmansachs.com/intelligence/pages/the-us-is-poised-for-an-energy-revolution.html>
- <https://www.gsam.com/content/gsam/us/en/institutions/market-insights/gsam-insights/perspectives/2023/us-inflation-reduction-act-is-driving-clean-energy-investment-one-year-in.html>
- <https://www.bnef.com/insights/31433>
- <https://www.weforum.org/agenda/2023/12/2024-elections-around-world/>

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