

Sustainability Practice

Decarbonize and create value: How incumbents can tackle the steep challenge

While the task is not easy, incumbents—including those in hard-to-abate sectors—can decarbonize and generate value through a series of key actions.

This article is a collaborative effort by Peter Crispeels, Dieuwert Inia, Henry Legge, Tomas Naclér, and Philipp Radtke, representing views from McKinsey's Sustainability, Global Energy & Materials, and Advanced Industries practices.



The net-zero transition could lead to the largest transformation of the industrial sector since the beginning of the Industrial Revolution. To reach net zero by 2050, about \$275 trillion in cumulative spending on low-emissions assets will be required over the next 30 years—or approximately 7.5 percent of global GDP every year for 30 years.¹ Decarbonizing operations and product offerings presents many companies with the most significant opportunity in a generation: a potential \$9 trillion to \$12 trillion in annual sales by 2030 as capital and customer demand shift toward a low-carbon economy. On the flip side, failure to decarbonize could, on average, risk up to 20 percent in economic profit for companies by 2030, based on factors including stranded assets, increasing cost of capital, and loss of market share.²

In any case, decarbonization is a difficult transformation for most companies. The costs for scaling climate technologies and building new capabilities can be high. Access to financing can be challenging for businesses entering nascent, untested markets. Timelines for decarbonization can conflict with performance objectives and often stretch beyond the expected tenure of the current company executives. Meanwhile, entire supply chains are still being rewired from fossil fuel–based energy and feedstock to renewable sources, which could lead to major shifts in energy costs and the viability of current assets. In the current moment, leaders are also navigating the added complexity of inflation, disruptions to energy markets, supply shortages, and increased interest rates. To survive—and, ideally, create value—companies will need to think through their decarbonization strategy, keep up with a shifting landscape of market opportunities and policy (from subsidies and regulatory schemes to the organization’s geographical footprint), and make swift decisions.

In some markets, start-ups have become early leaders in decarbonization (renewable energy, electric vehicles, and steel, for example). Start-ups often have a higher tolerance for risk-taking and the

ability to operate at faster speeds with agility. But a set of incumbents has emerged as market leaders, too. These incumbents, including many in hard-to-abate sectors (such as chemicals and steel), have leveraged a few of their advantages, including long-term customer relationships and access to capital, talent, industry insights, and supplier networks. These established players, from industrial companies to logistics and consumer goods organizations, have been willing to take bold action and play offense to get ahead of their competitors.

How can more incumbents decarbonize *and* create value? Based on our experience, companies that are a step ahead in their decarbonization transformation tend to take action in three key areas. In this article, we explore the three key areas, a new tool that can help leaders build the business case for net-zero offerings, and reasons to move quickly.

Decarbonize and create value: Three moves for incumbents

In our experience, incumbents that have created value through decarbonization have focused on three key areas of action:

- ***Decarbonize and improve cost competitiveness.*** Companies that reduce costs and emissions simultaneously can gain market share and finance further decarbonization efforts through the additional cash generated. Leading companies typically go after the first 20 to 40 percent of decarbonization while also reducing costs, leading to an improvement in EBITDA.³
- ***Launch net-zero offerings.*** Companies that are quick to offer zero-carbon offerings can leverage inherent supply–demand gaps in nascent markets and create value through value-based pricing strategies and price premiums.
- ***Enter new value pools.*** Companies that build new businesses along the current value

¹“The economic transformation: What would change in the net-zero transition,” McKinsey, January 25, 2022.

²“Playing offense to create value in the net-zero transition,” *McKinsey Quarterly*, April 13, 2022.

³ Based on net present value.

chain—and tap adjacent value pools—have an opportunity to secure early demand for net-zero offerings and benefit from low-cost financing.

Decarbonize and improve cost competitiveness

In the past two to three years, we've seen an increasing number of companies set ambitious decarbonization commitments. To date, more than 6,000 companies have signed up through the Science Based Targets initiative to achieve an average reduction of 49 percent in Scope 1 and 2 emissions and 28 percent in Scope 3 emissions by 2030.⁴ Now companies face the steep challenge of making the reductions a reality.

Many organizations have begun their decarbonization journey by looking to cut emissions from operations. Traditionally, some leaders have

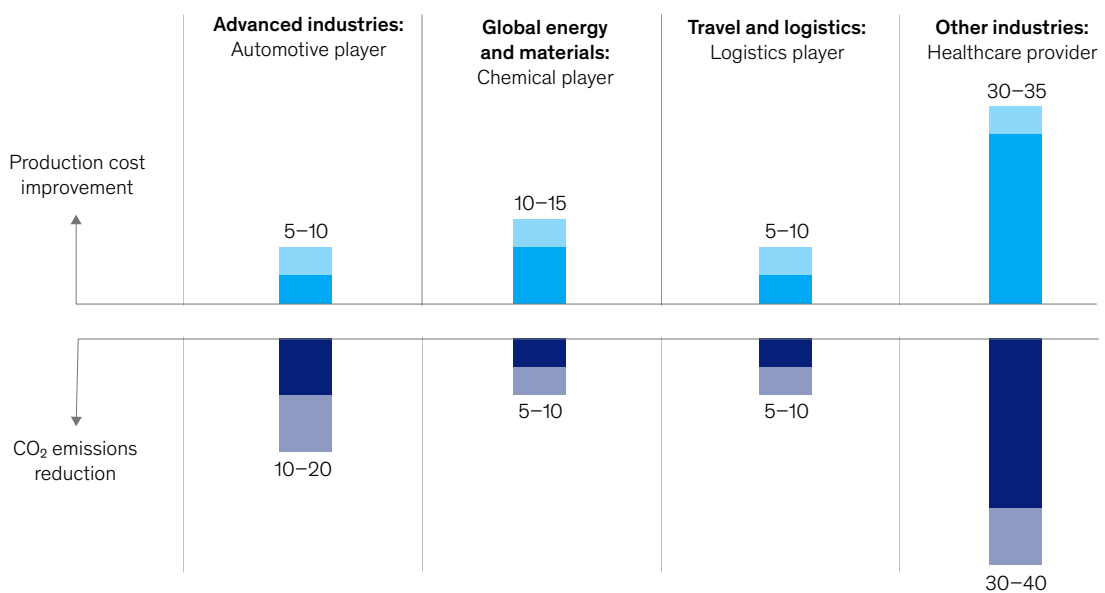
assumed there is a financial trade-off for reducing emissions in operations, and for good reason: decarbonizing operations can be complex and capital intensive. We've also seen companies try to decarbonize operations through a stand-alone program that isn't fully integrated with the core business, which can limit both the potential for emissions reductions and a healthy balance sheet.

Now, however, we see leading organizations integrate cost and carbon reductions simultaneously. Our analysis shows that companies are already seeing results: up to 40 percent reductions in emissions and up to a 15 percent improvement in financial performance (Exhibit 1). By 2030, incumbents can, on average, abate 20 to 40 percent of emissions while also reducing their production costs (Exhibit 2). A reduction

Exhibit 1

Companies across industries can reduce carbon emissions and improve financial performance at the same time.

Illustrative financial improvement and CO₂ reduction, %



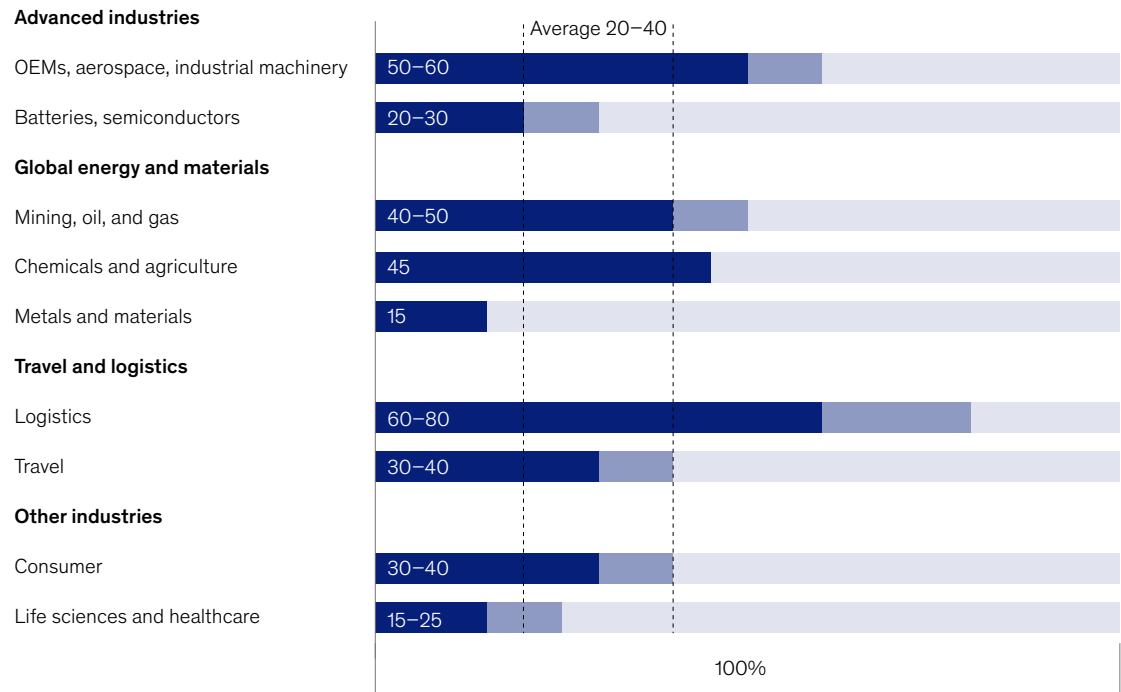
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⁴ Scope 1 emissions are direct emissions that occur from sources that are controlled or owned by an organization; Scope 2 emissions are indirect emissions associated with purchased energy; and Scope 3 emissions are indirect emissions resulting from activities along an organization's value chain. Science Based Targets initiative dashboard, accessed September 26, 2023; US Environmental Protection Agency.

Exhibit 2

Incumbent companies can, on average, abate 20 to 40 percent of carbon emissions by 2030 while also reducing costs.

Cost-effective emission abatement by 2030, by sector,¹ %



¹Includes Scope 1, 2, and 3 emissions. Based on net present value.
Source: McKinsey Catalyst Zero

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in production costs could be driven by energy efficiency, sourcing green energy, and variable cost reduction (yield and throughput increase, for example) of the manufacturing footprint. The potential for dual cost and carbon savings varies by industry. However, in some sectors, we see the potential to reduce emissions by as much as 60 to 80 percent while still having a favorable business case based on net present value.

Reducing costs and carbon simultaneously can also free up cash to invest in new business opportunities that emerge from the ongoing net-zero transition.

Integrating cost and carbon reductions can also help companies gain market share. As both the public and private sectors increasingly set demands

on sustainability, organizations that are ahead on decarbonization could be positioned to earn early contracts in growing markets and generate revenue faster than competitors. This advantage for early movers will likely fade as competitors catch up. However, as more market players decarbonize, global emissions should go down—a societal benefit—and end customers should experience more competitive pricing.

The dual task of cutting costs and carbon emissions is not easy. Decarbonizing operations often requires a transformation of processes and capabilities. There needs to be clear buy-in and accountability from leadership, as well as the ability for leaders to continuously reevaluate the

decarbonization strategy as input costs change (energy prices, for example) and new technologies become commercially available. However, many incumbents—including those in harder-to-abate sectors—have advantages, such as the ability to engineer large-scale production processes, technological know-how, and investment flexibility. In our experience, companies successfully integrate cost and carbon reductions through a few approaches, from assessing carbon emissions on a granular level to embedding decarbonization in all processes:

- ***Make fact-based decisions through full carbon transparency on an asset and product level.*** Leading companies look for carbon and cost reductions on a granular level, down to all assets and product offerings, and operate with full carbon transparency for stakeholders and customers. For example, a leading chemicals player calculates detailed product carbon footprints for approximately 45,000 products, which enables the company to create viable decarbonization pathways and offer their customers a better understanding of a product's carbon footprint. Based on our analysis, such a granular approach can save companies an additional 10 to 20 percent in costs on average.⁵
- ***Focus on capturing the first 20 to 40 percent of emissions.*** We are seeing companies integrate cost and carbon reductions in several ways, from improving energy efficiency to reducing waste to designing products more efficiently.⁶ However, companies often struggle to understand which measures will yield the most savings and how to focus engineering resources and financing. In our experience, leading companies focus on capturing an initial 20 to 40 percent of emissions while also reducing costs.
- ***Embed decarbonization in all processes.*** Eventually, decarbonization should be embedded in all critical processes. Incumbents

will have different areas of focus, based on their sector and where they are in the value chain. Metals, chemicals, and mining companies might focus on plant design and related capital expenditures, whereas technology and component companies might emphasize product design and embedded emissions. For example, a large industrial-equipment manufacturer has set various decarbonization KPIs across all areas of the organization, from embedded emissions in procurement to share of recycled material in product design. Moving quickly to embed decarbonization objectives in all processes, in some cases, can help companies achieve cost efficiency faster and give the organization a head start on building new capabilities.

- ***Stay agile in decision making and capital reallocation.*** By 2050, about 90 percent of total global emissions can be reduced with existing climate technologies—however, many of these technologies are not currently cost competitive, and only 10 to 15 percent are considered commercially mature.⁷ As markets evolve and new climate technologies become commercialized, leaders should remain flexible in their decarbonization plans and capital allocation, with an eye toward cost savings and value creation.
- ***Use supply chain partnerships to accelerate the next wave of emissions reductions.*** Companies can also build long-term strategic partnerships with technology providers to help them grow and capture economies of scale, which can, over time, lead to cost reductions on emerging climate technologies for the buyers. For example, electrolyzers, which are key to producing clean hydrogen, are increasingly in demand. Proactive companies are partnering with electrolyzer providers to secure long-term supply at competitive prices.

⁵ Based on net present value.

⁶ For more, see Laura Corb, Anna Granskog, Tomas Nauc ler, and Daniel Pachtod, "Full throttle on net zero: Creating value in the face of uncertainty," McKinsey, September 20, 2023; and Peter Crispeels, Mikael Robertson, Ken Somers, and Eric Wiebes, "Outsprinting the energy crisis," McKinsey, April 21, 2022.

⁷ International Energy Agency; McKinsey Sustainability Insights.

Launch net-zero offerings

Demand for net-zero offerings is surging—so much so that there could be shortages in certain sectors. According to our analysis, in steel, cement, and chemicals, for example, there could be up to a 60 percent supply–demand gap in 2030 for net-zero products. While such shortages could temporarily slow the net-zero transition, there is an opportunity for fast-moving players to capture the value of full decarbonization through value-based pricing strategies (moving away from a “cost plus” approach to one that factors in the value of decarbonization, for example) or earning a price premium on green goods and services. In some sectors, we’re already seeing green premiums of 15 to 30 percent. In many markets, particularly in Europe, the ability to sell excess carbon allowances further strengthens the business case for green offerings. According to our analysis of green steel, for instance, producers in Europe that combine a green premium with the sale of excess carbon allowances could earn a 30 percent return on capital employed by 2035. Similar opportunities exist for many other products and services.

Another way to build the business case for net-zero offerings could be to use a marginal abatement revenue and cost curve (MARCC) on a product level. A MARCC, a new concept we have developed, shifts the discussion of offering net-zero goods and services from *only* cost to the total value of the opportunity. To create a MARCC, we start with the cost to decarbonize a product and then add the green premiums that we anticipate the net-zero version of the product can earn. Looking at just the costs of net-zero products, for example, shows that, on average, net-zero products incur an overall cost that is 10 to 30 percent higher than their more carbon-intensive counterparts.⁸ These figures suggest that creating net-zero offerings would erode margins and destroy value for companies. However, a cross-sector MARCC for net-zero offerings, which captures the potential revenue upside of green premiums, reveals that incumbents can reduce emissions by up to 80 percent and create value (Exhibit 3).

Launching net-zero offerings successfully is not a given. A thorough market analysis and strategy is needed to identify the markets where net-zero products could generate green premiums, particularly if leaders set ambitious carbon abatement goals or foresee large capital expenditures. Companies often need to move quickly in markets where there are supply shortages, creating new markets and product categories, and working with partners across the value chain to maximize carbon reductions. However, incumbents that have existing production models, familiarity with a customer base, and experience with supply chains should have a leg up. The following are specific actions companies can take to help ensure a successful product launch:

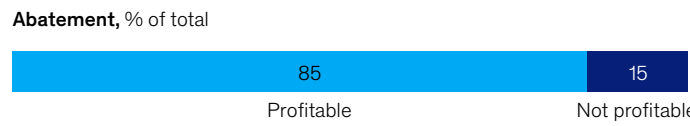
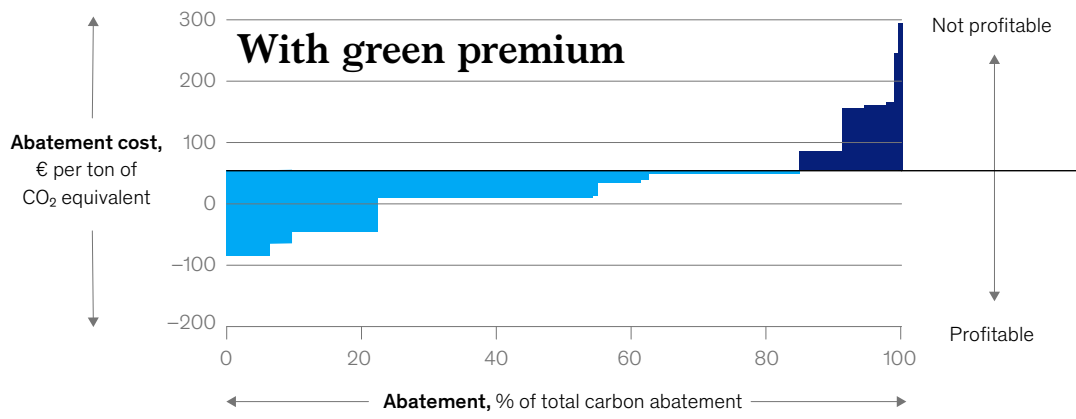
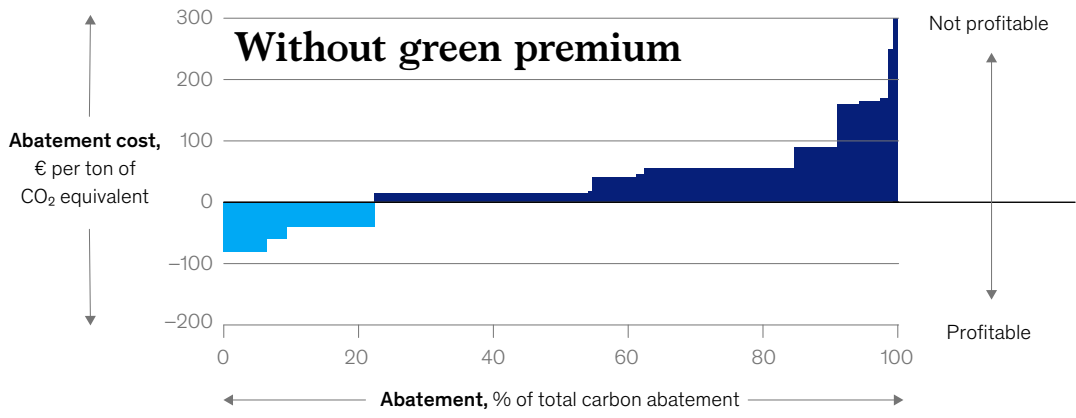
- **Identify high-potential net-zero markets.** Leading companies start with a key question: What net-zero offerings can we provide in markets where there will be structural supply shortages for the foreseeable future?
- **Create new markets and rethink pricing strategies.** Many players who have successfully launched net-zero products have created and shaped new markets. They have achieved this in part through CEO-to-CEO sales (versus selling through the procurement organization). In these CEO-level conversations, leaders can secure early production offtakes and earn a price premium. For example, leadership at SSAB, which is developing fossil fuel–free steel made with hydrogen, has partnered with automotive incumbents to gain early sales. Companies that have identified new opportunities for greener products, like SSAB, have been able to capture a 20 to 30 percent premium.
- **Secure green supplier partnerships for Scope 2 and 3 emissions.** Producing net-zero goods requires reducing emissions across the supply chain (Scope 2 and 3 emissions). Developing long-term partnerships with suppliers to derisk procurement and substitute high-emissions inputs with low-emissions inputs is key, as well as ensuring carbon transparency across

⁸ *The net-zero transition: What it would cost, what it could bring*, McKinsey Global Institute, January 2022.

Exhibit 3

Companies can build the business case for net-zero offerings by factoring a green premium into costs curves.

Illustrative marginal abatement revenue and cost curve for net-zero offerings



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the value chain. For example, to decarbonize electricity at its plants and realize its goal of delivering net-zero products, chemical

company BASF has worked with energy developers to support the construction of large offshore wind farms.

- **Tap financial partners and asset-level project financing.** To transform the core business around new net-zero offerings, many companies will need to build new plants and facilities. Creating this infrastructure could require billions of dollars in investment. Companies can rethink how they access funding. To finance the construction of its first plant project, H2 Green Steel has raised more than €1.8 billion in equity from a broad group of investors.⁹ Energy company Ørsted has financed its transition to becoming the world's leading offshore-wind power producer through a strategy that includes operational cash flows, debt issuances, investment partners, and risk management.¹⁰
- **Finance new offerings by improving margins in the core.** New net-zero offerings can come with uncertainty in still-evolving markets. A stable and cash-generating core can help keep the business foundation stable while transitioning to the new offerings. To maximize this potential, companies can look to cut costs and improve margins in the core business.
- **Execute fast to capture premiums.** Green premiums won't be around forever. We anticipate that there will be shortages of green products in multiple industries through 2035 (for example, steel, copper, plastics, and cement). Getting ahead of value on the cost curve could set companies up for green premiums in the short term and robust market share going forward. We are already seeing green premium opportunities in steel and recycled plastics. For example, high-quality recycled plastics reached an average premium of up to 60 percent over virgin plastics.¹¹ One way to move quickly on new offerings is to do “parallel scaling”—that is, initiate additional growth waves before the first one is complete.¹²

Enter new value pools

The net-zero transition can generate vast business-building opportunities for organizations. Since 2015, six decacorns and 135 unicorns have been created within the sustainability space.¹³ However, building green businesses isn't just a game for start-ups. As markets transition to green offerings, new value pools will emerge—in many cases, upstream or downstream of a company's current value chain position. There is an opportunity for incumbents to enter these new value pools, provided they move quickly and strategically.

Incumbents might not be naturals at building disruptive ventures. However, in recent years, we have seen incumbents flex a few advantages in building new green businesses, from securing strategic partnerships to attracting low-cost financing, while also embracing the speed and agility of a start-up.

That said, entering new value pools has challenges. It often requires, for example, a new set of capabilities and new types of risk management. Companies can consider a set of actions to mitigate risks while scaling new ventures:

- **Use the core business to secure captive demand.** A critical hurdle for new ventures is to find early-stage customers and partners to secure demand. Maersk, for example, has taken a few steps to create both supply and demand for green shipping fuels. The company has announced plans to invest in a green ammonia facility, along with ferry operator DFDS, and recently set up a green methanol company.¹⁴ Such ventures support the company's decarbonization ambitions and position the organization to gain market share in a nascent but growing market.

⁹ “H2 Green Steel raises €1.5 billion in equity to build the world's first green steel plant,” H2 Green Steel news release, September 7, 2023.

¹⁰ “Ørsted's renewable-energy transformation,” McKinsey, July 10, 2020; “Funding strategy,” Ørsted, accessed October 4, 2023.

¹¹ Marcelo Azevedo, Anna Moore, Caroline Van den Heuvel, and Michel Van Hoey, “Capturing the green-premium value from sustainable materials,” McKinsey, October 28, 2022.

¹² For more, see Rob Bland, Anna Granskog, and Tomas Naucclér, “Accelerating toward net zero: The green business building opportunity,” McKinsey, June 14, 2022.

¹³ McKinsey analysis of PitchBook and HolonIQ data.

¹⁴ “Maersk backs plan to build Europe's largest green ammonia facility,” Maersk press release, February 23, 2021; Johannes Birkebaek and Jacob Gronholt-pedersen, “Shipping group Maersk sets up green methanol company,” Reuters, September 14, 2023.

Making strategic moves now could be the difference between gaining market share and being stuck with higher costs for entry later on.

- **Secure low-cost financing based on secured demand.** Once captive demand is secured, established players can use their existing network and reputation to help their venture attract low-cost funding. For example, in 2017, Volvo Cars established Polestar as an independent electric-vehicle brand, leveraging its existing assets, capabilities, and customer and supplier relationships to swiftly develop a fully electric stand-alone brand. By utilizing platforms and technologies from Volvo Cars, Polestar was able to adopt an asset-light business model and efficiently create its first models. Volvo Cars' balance sheet, liquidity, and cash position can provide support to Polestar while simultaneously executing its own plans to transition into a fully electric-car company by 2030.
- **Run a stand-alone new business and recruit new talent.** Incumbents can consider providing assets, capabilities, and relationships to a new business. At the same time, incumbents should also consider keeping new ventures at arm's length operationally to establish a fast-paced, agile culture and operating model, while still enabling additional equity to be added by partners if needed. Additionally, companies can look to set up their ventures with new capabilities and talent to succeed, as new parts of the value chain might require new areas of expertise. These moves can help the new business scale faster and rapidly adapt to emerging opportunities.

Now is the time to strike

Companies, for good reason, may hesitate to commit resources without complete clarity on their business case for decarbonization. However, our perspective is that now is the time to strike. Cost curves for green technologies are moving down across industries, and as we discussed earlier, some green premiums may have a shelf life. Making strategic moves now could be the difference between gaining market share and securing profitable growth, versus being stuck with stranded assets and higher costs for entry later on.

The three areas of action we have outlined are not a one-size-fits-all model, and implementing all three at once could indeed be a steep task. Leaders can prioritize based on factors including sector supply-demand dynamics, value chain opportunities, cost analysis, commercially available climate technologies, and evolving policy.

To decarbonize operations, leaders can swiftly act on the most cost-efficient moves that still help achieve decarbonization targets. As we noted earlier, launching net-zero products and services ahead of the competition has the potential to earn green premiums, a source of capital for scaling. When to enter a new value pool may depend on the pace of technological advancement, as well as regulatory changes. While it is impossible to predict such developments, companies would be wise to anticipate change in these areas and be prepared to jump on opportunities—before the competitive landscape gets crowded. For example, last year's Inflation Reduction Act in the United States, which

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allocates about \$370 billion for climate and energy spending, and multiple policy packages under the umbrella of the European Green Deal, could accelerate pockets of the net-zero economy and facilitate access to funding.

The net-zero transition presents challenges for incumbents, particularly those in hard-to-abate sectors. At the same time, established companies have a unique opportunity to decarbonize and create value. While there is no one universal approach, making timely moves across three key action areas could help companies create a competitive advantage in the years to come.

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