



Spurring Economic Growth Through Climate Action

By Cornelius Pieper and Tina Zuzek

President Joe Biden has pledged to put the climate crisis at the heart of US policy action, with a goal of achieving net-zero emissions nationwide by 2050.

Our analysis, going back to 2010, indicates that the country can achieve approximately 80% of this goal with existing technologies—and we can reach 100% with technological innovation and carbon credits for the hardest-to-abate sectors.

The incoming administration has an extraordinary opportunity to combat climate change in ways that [generate near-term macroeconomic payback and long-term growth](#).¹ The key to accomplishing this goal is to focus on the biggest US contributors to the climate crisis and prioritize the most efficient emissions reduction measures—in the right order and at the right time—to promote systemic change.¹

The investment will be substantial and the transition will take time, but taking the necessary steps will increase GDP, boost job growth, and deliver positive returns for the US economy. With the right strategic approach, the transition to a net-zero economy will produce the following desirable effects:

- ◆ Create good jobs that are difficult to outsource
- ◆ Drive long-term economic growth and national security
- ◆ Provide new sources of revenue and trigger innovation
- ◆ Help US businesses build competitive advantage domestically and globally
- ◆ Ensure environmental justice

¹[Article link: *The Economic Case for Combating Climate Change*.](#)



Understanding Key Drivers

Effectively addressing climate change will require a broad-scale, multipronged effort.

Some areas are bigger contributors to the problem than others, however, and any solution must address them quickly. The US sectors that contribute the most to greenhouse gas (GHG) emissions are transportation, power, and industry:

28%

Transportation

(% of greenhouse gas emissions)

Passenger vehicles, trucks, buses, and planes are all large contributors to emissions.

27%

Electricity Generation

(% of greenhouse gas emissions)

The US still relies on coal and natural gas for 63% of power generation; coal makes up ~66% of emissions from the sector.

22%

Industry

(% of greenhouse gas emissions)

Emissions come from companies burning fossil fuels for energy and heat.

* Other big contributors to emissions include commercial and residential emissions (12.3%), and agriculture (9.9%).



Three Major Levers for Reducing Emissions

BCG estimates that the US can achieve approximately 80% of the progress toward net zero by using existing technologies.



The key is to apply them broadly, swiftly, and in the right sequence. Three broad sets of levers exist.

Abate

Several strategies are available for avoiding CO₂ emissions:

- ◆ Shift the sources of electricity generation to cleaner, renewable technologies such as solar and wind, perform this transition at scale, and support it with improvements in battery storage and the power grid.
- ◆ Invest in electric heat, rather than natural gas, when the grid is clean enough to support it.
- ◆ Use heat pumps powered by renewable electricity as a partial replacement for natural gas in residential and commercial heating and appliances.
- ◆ Increase investments in energy efficiency and demand management to reduce needs.
- ◆ Electrify transportation and improve its efficiency. This is easier to do in the case of passenger vehicles, but it may require adoption of new technologies, such as hydrogen fuel cells and biofuels, for medium- and heavy-duty vehicles. At the same time, invest in infrastructure such as public transit and freight and passenger rail.
- ◆ Optimize and gradually decarbonize industrial processes by increasing efficiency, changing feedstock, and using green hydrogen (in steel production, for example).²

²[Article link: The Real Promise of Hydrogen.](#)

Capture

- ◆ Capture emissions at the source for use in other applications (such as chemical feedstock) or for placement in long-term storage. Carbon capture and storage technology is becoming more mature and economically viable, and a healthy and increasing pipeline of projects in the US offers significant opportunities for industry.

Remove

- ◆ Use technologies such as biochar and direct air capture to remove emitted CO₂ from the atmosphere, and support nature-based solutions such as carbon sequestration, reforestation, and ocean fertilization. Some of these technologies exist today, but many remain subscale and require further development before they can have a meaningful impact.



Prioritizing Climate Action for Maximum Impact

Implementing technologies to combat climate change will transform many sectors of the US economy.

The power sector will see installation of tens of thousands of new wind turbines and thousands of square miles of new solar panels, along with upgrades and additions to the transmission grid.³ In automotive, millions of new electric vehicles (EVs) must be produced and will require a charging infrastructure.⁴ In industry, hundreds of thousands of factories will receive efficiency upgrades, and millions of buildings will acquire better insulation, more efficient AC, and heat pumps.⁵ As a result, profit pools will shift from fossil-fuel-based industries to clean energy and low-carbon technologies—offering sizable economic opportunities.

Despite having access to the most advanced technologies, the US has lagged behind the EU, China, Korea, Japan, and other nations in commercializing low-carbon innovations at scale,

putting it at a competitive disadvantage. In addition, as the EU considers imposing a carbon border tax on imported goods, US companies are also at risk of losing market share either to EU-based competitors or to carbon-efficient companies in other nations.⁶ Defining the right set of policies across all levels of government is critical to maintaining US competitiveness. At the same time, leading US corporations associated with the Business Roundtable and similar organizations are starting to address climate change—and they have already called for a price on carbon and other market-based solutions.

The US can ground implementation in a sound strategy and a business mindset, giving particular attention to three considerations:

³Article link: [A Simple Plan for Modernizing the Power Grid.](#)

⁴Article link: [The Costs of Revving Up the Grid for Electric Vehicles.](#)

⁵Article link: [The Green Factory of the Future.](#)

⁶Article link: [How an EU Carbon Border Tax Could Jolt World Trade.](#)

Order of operations is important

Building renewable energy sources is the key enabler for the subsequent wave of decarbonization levers, ensuring that every new EV or heat pump will run on clean electricity. To get the most bang for the buck, planners should prioritize pursuing the most cost-effective abatement opportunities first.

Local and regional interdependencies will emerge

It is essential to identify an integrated, future-proof solution that works across energy, mobility, industry, and buildings, and takes into account interdependencies such as shared rights-of-way and regional needs. For example, launching EV programs in the Midwest will be less effective if the focus of major grid upgrades is the Southwest.

A just transition of the workforce is essential

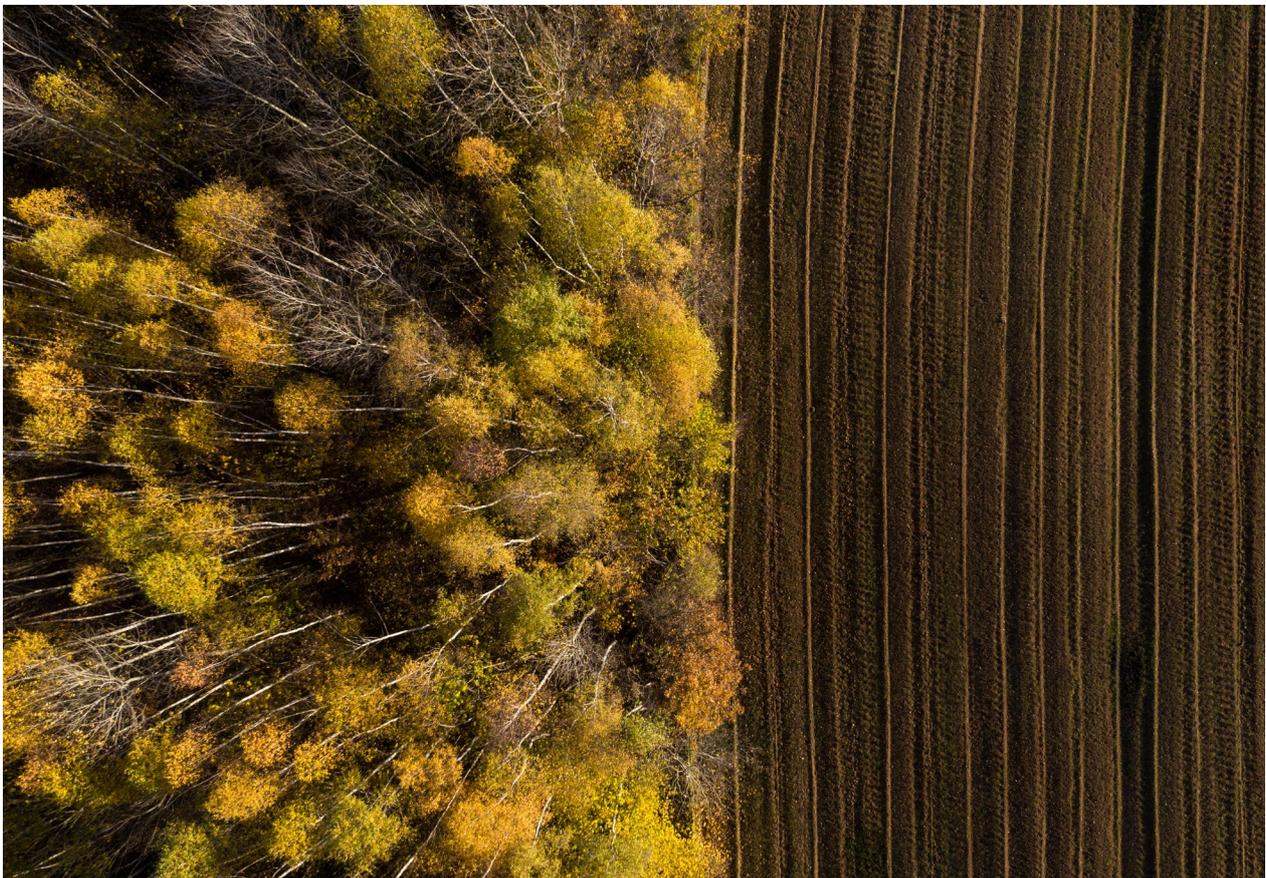
The clean energy sector employs approximately 3 million people in the US, and that figure will grow substantially in coming years. At the same time, some industries will see declining employment. The coal industry, for example, has already seen employment decrease by 40,000 in the past decade, according to the Federal Reserve Bank. Therefore, the goal is to promote a just transition to ensure that displaced workers can find new, high-paying jobs in clean energy.



Key Elements of the US Climate Strategy

President Biden signed a number of climate-related executive orders immediately after taking office—many of them aligned with our recommendations.

The Biden administration has been able to take this action because the maturity of technology has advanced to a stage where it no longer poses a bottleneck to immediate and significant progress.



In the long term, a [successful climate policy](#) would address four topics:⁷

01 Leverage smart carbon pricing mechanisms:

To incentivize desirable investments and prevent harmful ones. This approach is much more efficient than patchwork regulations and state-by-state solutions, but it is still quite unpopular in the US.

02 Institute carbon border adjustments:

To [avoid carbon leakage](#), so that high-emissions-industry players don't simply move abroad to remain competitive—a strategy that would shift but not reduce global emissions.⁸

03 Redistribute proceeds:

Where necessary to ensure equity and compensate those who are most negatively affected.

04 Correct non-price-related market inefficiencies:

Such as regulatory hurdles tied to permits, building codes, zoning laws, and the like, while focusing on solutions that align the thousands of disparate actors involved and coordinate their responses.

⁷[Article link: A New Course for Climate in the US?](#)

⁸[Article link: Why Climate Change Is No Prisoner's Dilemma.](#)

Four Actions the Biden Administration Can Take Now

The US could take four major actions right away:

01 Build the base:

Focus federal spending and tax credits on developing a more competitive US manufacturing base for EVs and renewables to create jobs.

Continue to support early-stage R&D in areas such as energy storage, carbon removal technologies, and hydrogen to further develop the sector and support innovation. This strategy is already on the agenda for ARPA-C, the new, cross-agency Advanced Research Projects Agency focused on climate.

02 Choose incentives wisely:

Offer incentives for infrastructure investment in areas such as renewable power generation, transmission, and distribution grid reinforcements.

Provide state-level support for utility earnings on EVs, energy efficiency, and distributed energy resources, paired with ambitious targets.

Offer regulatory incentives to implement efficiency improvements in industry and buildings.

03 Leverage federal authority where appropriate:

Strategically deploy the federal government’s procurement authority to support appropriate infrastructure initiatives—for example (as President Biden has already announced), replacing the federal fleet with EVs.

Use federal rights to lease and issue permits for renewable power generation.

Engage industry in enhancing disclosures on climate risks, costs, and opportunities.

Drive the formulation of stronger code provisions where possible—for example, with building codes, appliances, and Corporate Average Fuel Economy (CAFE) standards. At the same time, thoughtfully continue the new administration’s actions reversing regulatory rollbacks in areas such as methane emissions in gas production and pollutants from coal power plants.

04 Use market-based mechanisms:

Consider introducing mechanisms that effectively price externalities associated with pollution—such as a carbon tax that takes into account the full carbon content of the value chain.

In the absence of carbon pricing (an unpopular option in the US), consider appropriate WTO-compliant border adjustment mechanisms to mitigate the risk of carbon leakage.

Taken together, these actions can define the US's climate pathway and form the backbone of a climate-oriented industrial policy that will engage key sectors, create new business opportunities, generate hundreds of thousands of new jobs, and support the transition to a low-carbon economy.

The \$900 billion stimulus package, enacted in December 2020 with bipartisan support, moved in the right direction by extending clean energy tax credits, making federal lands available for renewable generation, and launching programs to bolster energy efficiency, R&D, and other enablers of the upcoming transition.

Providing the right set of incentives will unleash the innovation power of US corporations and startups and position the US as a leading nation in the global transition to a low-carbon economy over the next three decades.

BCG's Net-Zero Pledge

BCG is working with private-, public-, and social-sector clients across the US and globally to develop solutions that address the climate challenge, with a clear focus on the opportunities that corporations and economies will discover when they commit to a just transition and a low-carbon economy.

As we partner with our clients to help them realize their net-zero ambitions, we must continue to change the way we operate as a firm. The world needs to reach net-zero carbon emissions by 2050, but organizations that can move faster should do so. BCG is proud to [announce our next climate action steps](#) in three key areas where we can have a major impact:⁹

01

Achieving net-zero climate impact by 2030

02

Partnering with clients to drive climate action

03

Helping to shape the global climate agenda

⁹[Article link: BCG's Net-Zero Pledge.](#)



BCG's Climate Experts in North America

BCG has deep climate expertise across industries and the public sector in North America. For more information, please reach out to the team members below.



Cornelius Pieper
Managing Director and Partner
Industrial Goods
Boston
pieper.cornelius@bcg.com



Tina Zuzek
Managing Director and Partner
Energy and Public Sector
Washington, D.C.
zuzek.tina@bcg.com



Aakash Arora
 Managing Director
 and Partner
 Industrial Goods
 Boston



Alex Dewar
 Senior Director
 Energy
 Washington, D.C



Amanda Brimmer
 Managing Director
 and Partner
 Industrial Goods
 Chicago



Chrissy O'Brien
 Managing Director
 and Partner
 Global/Cross-Industry
 Boston



Clint Follette
 Managing Director
 and Partner
 Energy
 Houston



Decker Walker
 Managing Director
 and Partner
 Industrial Goods
 Chicago



Ilshat Kharisov
 Managing Director
 and Partner
 Energy
 Houston



Nathan Niese
 Partner and
 Associate Director
 Industrial Goods
 Chicago



Paulina Ponce De Leon
 Principal
 Global/Cross-Industry
 San Francisco



Rich Hutchinson
 Managing Director
 and Senior Partner
 Global Leader -
 Social Impact
Atlanta



Roy Choudhury
 Managing Director
 and Partner
 Finance
 New York



Santosh Appathurai
 Partner
 Energy
 Houston



Simon Rees
 Managing Director
 and Partner
 Industrial Goods
 Chicago



Tom Baker
 Managing Director
 and Partner
 Energy
 San Francisco



Veronica Chau
 Partner and Director
 Finance
 Toronto

For Further Reading

Visit [BCG's Center for Climate Action](#) for in-depth analyses of climate issues, including these.



A New Course for Climate in the US?

Over the past four years, the federal government and state and local governments in the US have sharply diverged on climate change policy. While the Trump administration has pursued broad energy and environmental regulatory rollbacks, many state and local governments have adopted wide-ranging climate policies. Now that Joe Biden has won the presidential election, the federal government is likely to shift decisively on climate policy.

[Read More](#)



Supply Chains as a Game-Changer in the Fight Against Climate Change

For companies, especially those in consumer-facing sectors, end-to-end supply chain emissions are much higher than the direct emissions from their own operations. By implementing a net-zero supply chain, companies can amplify their climate impact, enable emission reductions in hard-to-abate sectors, and accelerate climate action in countries where it would otherwise not be high on the agenda.

[Read More](#)



How COVID-19 Is Changing the Pace of Energy Transitions

In the pre-COVID-19 pandemic environment, the contours of energy transitions toward low-carbon sources were becoming clear. Europe and North America were driving much of the initial adoption of renewable power generation and electrification of energy consumption. Asian countries were generally slower to ramp up low-carbon energy technologies, although their adoption of wind, solar, battery, and electric vehicle (EV) technologies was rapidly accelerating.

[Read More](#)



How Government Can Fuel a Green Recovery

The public sector's response to the COVID-19 pandemic has been unparalleled. To date, governments have pumped more than \$11 trillion in direct stimulus funding into their economies, and these programs are likely just the opening salvo. Such spending dwarfs the \$600 billion per year that governments, multilateral agencies, and the private sector around the world allocate to climate investments, according to the Climate Policy Initiative's estimate.

[Read More](#)



Mining Needs to Go Faster on Climate

When it comes to climate change, we've clearly entered a new era. Until now, many players in the mining industry had taken a wait-and-see approach. Today, the impacts of climate change, including skyrocketing costs from weather-related damage, are far more visible. Tomorrow, the effects of global warming could escalate further, leading to ever more regulation, carbon taxation, changes in demand for commodities, and divestment pressures.

[Read More](#)



Think Small to Unlock Carbon Capture’s Big Potential

Carbon capture is potentially on the cusp of acquiring a major role in meeting the world’s climate change mitigation goals. The challenge: how to transform this expensive, 40-year-old niche technology into one that is mainstream and cost competitive.

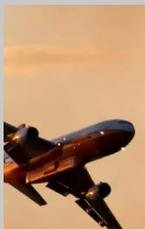
[Read More](#)



Have We Passed Peak Demand for Fossil Fuels?

With the COVID-19 pandemic still in full swing, energy companies around the globe are in containment mode to cope with its considerable short-term impact. But hiding in the shadows of the current crisis is a possibility with even greater potential implications for global energy markets: the world may already have passed peak demand for fossil fuels.

[Read More](#)



The Sustainability Opportunity for Aerospace

The biggest long-term threat to the commercial aerospace industry right now isn’t COVID-19 but the need for sustainability. True, the pandemic has led to a steep decline in demand for air travel. But that is a short-term issue. More broadly, the industry has set ambitious targets to reduce greenhouse gas emissions by 2050, and it is currently not on track to achieve them. As awareness grows about the environmental impact of air travel, and as consumer preferences and behaviors shift, the industry’s profit pools are increasingly at risk.

[Read More](#)



Climate Action Pays Off in Transportation and Logistics

Leaders of transportation and logistics (T&L) companies need to transition from defense to offense in their approach to climate action. Typically, T&L executives have viewed sustainability efforts as a compliance burden or a potential source of cost savings. In addition to considering these issues, they need to recognize that climate action offers them a broader opportunity to create tangible value by tapping into new markets and meeting new types of demand for low-carbon services.

[Read More](#)



Climate Disruption and the Path to Profits for Machinery Makers

Few industries are as threatened by the specter of climate change as the makers of energy-driven machinery. As the world warms, companies in this sector will come under increasing pressure to decarbonize their products—everything from small air conditioners to huge mining equipment—and to reduce the adverse effects of their operations on the climate. The platforms they manufacture operate directly and indirectly in industrial processes that account for most of the greenhouse gas (GHG) emissions responsible for global warming.

[Read More](#)



© Boston Consulting Group, Inc. 2020. All rights reserved.

