

**Our View:
Achieving a Fifty Percent Reduction in US Emissions**

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April 26, 2021

President Biden has announced that the United States will seek to reduce its emissions of global warming gases to fifty percent of the amount discharged in 2005 by 2030. It is an ambitious goal that many believe cannot be achieved. However, various academics and policy wonks have issued reports complete with beautiful graphics that show how the target might be realized. *The Wall Street Journal* even posted a “do it yourself” computation tool that allowed readers to experiment with different ways to attain the reduction.¹

Our reading of the discussions reveals that most of those considering the issue see the goal as unreachable.² A key impediment raised, again and again, is Congress, a problem often overlooked by the environmentalists pushing hard to cut harmful emissions. They should take heed of a “political memo” by Nate Cohn in the April 9 *New York Times*. Cohn warns that the United States body politic is split in the way that Catholics and Protestants are divided in Ireland. The memo is headlined “Why Political Sectarianism Is a Growing Threat to American Democracy.”³ Among the shocking findings presented was that “one-third of Americans believe that violence could be justified to achieve political objectives.” Cohn reports that this includes most Republicans. Furthermore, one-third of Republicans and a fifth of Democrats would support secession, an idea floated by the late Rush Limbaugh last December after he declared that “peaceful coexistence” was no longer possible between liberals and conservatives.

American sectarianism will have a significant impact on efforts to lower emissions. It will likely block the passage of legislation that would promote the energy transition away from fossil fuels.

However, the Biden administration has a tool to make the sought-after reductions: the Renewable Fuel Standard (RFS) enacted under the Energy Policy Act of 2005. Under the RFS, the Environmental Protection Agency’s administrator must soon establish renewable fuel use targets for the years following 2022. Because the law expressly permits the administrator to consider “climate change” in setting the new standards, President Biden could use them to drive down US emissions.

The calculations presented below show that target reduction can be achieved with a fifty-five percent reduction in petroleum-based gasoline use and a thirty-five percent reduction in petroleum-based diesel fuel use by 2030. Price increases for these products, likely tied to a skyrocketing cost of renewable identification numbers or RINS, would produce the desired result.

Our “Petroleum in the Crosshairs” title is not a metaphor. The Biden program is taking direct aim at coal and oil. The administration has what it needs to attain its goal without new legislation, although new laws enacted with bipartisan support would be far superior.

¹ Ana Rivas, Juanje Gomez, Max Rust, and Roque Ruiz, “Climate Summit: How Do you Cut 50% of Greenhouse-Gas Emissions by 2030?” *The Wall Street Journal*, April 23, 2021 [<https://tinyurl.com/jev3c7pf>].

² See, for example, Meghan L. O’Sullivan, “A History of the Energy We Have Consumed,” *The New York Times*, June 18, 2018 [<https://tinyurl.com/wh5rkszn>].

³ Nate Cohn, “Why Political Sectarianism Is a Growing Threat to American Democracy,” *The New York Times*, April 19, 2021 [<https://tinyurl.com/3hwx34u4>].

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The Fifty-Percent Goal

Politico reported on April 13 that a coalition of more than four hundred major corporations and investors had written President Biden, calling on him to commit to a cut of fifty percent in US emissions from 2005 levels. The coalition is called “We Mean Business.” The Politico article provides this summary of the group’s proposal:

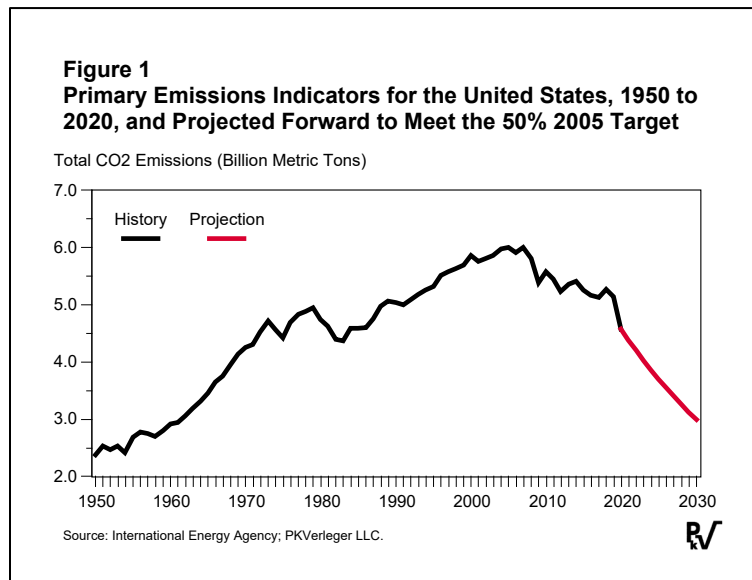
Business to Biden: If you raise the bar on climate, we will, too. Big investors and a list of blue-chip corporations asked President Joe Biden to commit to cutting U.S. greenhouse gas emissions in the next decade by at least 50 percent from 2005 levels. Audacious? Maybe. But the fact is that plenty of companies already are well on their way there, with or without Washington. And in a letter to Biden on Tuesday, they made him an offer. “If you raise the bar on our national ambition, we will raise our own ambition to move the U.S. forward on this journey,” the group wrote. “While an effective national climate strategy will require all of us, you alone can set the course by swiftly establishing a bold U.S. 2030 target.... You can count on our support.”⁴

A visit to the organization’s website finds an impressive signatory list of major American companies, including Amazon, Apple, Ford, General Electric, General Motors, Google, IHS Markit (owner of CERA), Microsoft, National Grid, and PG&E. Shell was the only oil company to sign the letter. No other oil firms and no airlines participated.

A key paragraph in the letter explained and justified the We Mean Business request:

A bold 2030 target is needed to catalyze a zero-emissions future, spur a robust economic recovery, create millions of well-paying jobs, and allow the U.S. to “build back better” from the pandemic. New investment in clean energy, energy efficiency, and clean transportation can build a strong, more equitable, and more inclusive American economy. A 2030 target will also guide the U.S. government’s approach to more sustainable and resilient infrastructure, zero-emissions vehicles and buildings, improved agricultural practices, and durable carbon removal. Finally, the commitment would inspire other industrialized nations to set bold targets of their own.⁵

News of the letter led us to examine the implications and feasibility of the We Mean Business proposal before the president announced the reduction goal on April 22 at the virtual international climate conference. We began by looking at total US energy emissions. The US amount is shown in Figure 1. The historical data there go from 1950 to 2020. We then extended the emissions data to 2030 with the goal of a fifty-percent reduction from 2005. This would put US 2030 emissions at three billion metric tons of carbon dioxide. For reference, US emissions were 5.138 billion metric tons in 2019. We Mean Business is calling for a forty-two percent reduction from 2019.



⁴ Lorraine Woellert, “Business to Biden: Join US,” Politico, April 13, 2021 [<https://tinyurl.com/mbc43mss>].

⁵ “Businesses & Investors Call for Ambitious U.S. NDC,” We Mean Business Coalition [<https://tinyurl.com/peft4x45>].

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To test the feasibility, we examined the emissions by sector in 2019. Table 1 presents emissions from five sectors: residential, commercial, industrial, transportation, and electric utilities. These are the five sectors that energy accountants identified almost a century ago to classify energy consumption.

	Residential	Commercial	Industrial	Transportation	Electric Utilities	Total
Coal		1.6	101.8	0.0	972.5	1,075.9
Natural Gas	276.2	193.4	543.3	54.9	617.9	1,685.7
Petroleum	66.4	59.6	361.0	1,861.9	16.3	2,365.2
Total Fossil Fuels	3	254.6	1,006.1	1,916.8	1,606.8	5,126.8
Total (%)	6.7	5.0	19.6	37.4	31.3	

Source: US EIA.

One can observe that the transportation and electric generation sectors account for the largest share of US emissions, with transportation tallying over thirty-seven percent of the total and utilities thirty-one percent. Note that this breakdown assigns emissions to their source. Energy accountants often attribute part of the fuel use and emissions from electricity generation to the sector consuming electricity because approximately two-thirds of the fossil fuels used to produce power are lost due to inefficiencies. Here, we assigned the emissions used to produce electricity to the electric generating sector.

In looking for a feasible way to reach the fifty-percent goal, we started with the electric sector. Wind and solar generation have been increasing rapidly. From 2010 to 2020, the amount of electric power generated by wind rose at a fourteen percent per year rate. Wind generation could become the largest single source of US electric power by 2030 if capacity continues to climb at that rate. Electricity generated by solar facilities has been increasing at an even more incredible rate of fifty-four percent per year. We doubt that this pace can be maintained. Consequently, in projecting we used the fourteen percent per year rate observed for wind.

The utility sector's use of coal can be terminated, and its natural gas use can decline by two percent per year for the rest of the decade *if* the growth in solar and wind capacity is maintained and total electricity production remains at 2020 levels. In theory—the word “theory” needs to be emphasized—the United States' electricity needs can be met while natural gas use decreases and coal use ends. This adjustment cuts US emissions by roughly one billion metric tons.

Most of the remaining reductions must come from the transportation and industrial sectors because the residential and commercial sectors account for limited direct emissions. In 2019, the industrial sector accounted for nineteen percent of emissions (one billion metric tons), while the transportation sector accounted for almost twenty percent (1.9 billion metric tons).

Most studies indicate that reductions in the industrial sector will require new technologies and new materials. Cement production, for example, is highly energy intensive. The only way to reduce emissions fifty percent by 2030 is to cut the transportation sector by 0.7 billion tons or forty-one percent. Most of that reduction must be from gasoline and diesel fuel use.

Gasoline and Diesel Bear the Burden

The possible impact on gasoline consumption in 2030 can be seen in Table 2 (page 4). The table shows the emissions for each principal fuel used in the transportation sector in 2019 (in million metric tons) and the level of use in 2030 required to achieve the fifty-percent reduction from 2005 announced by President

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Biden and encouraged by the We Mean Business Coalition. The essential reductions in 2030 occur with diesel and gasoline.

Note that the emissions data published by the Department of Energy for these fuels exclude the use of renewable fuels such as biodiesel and ethanol. The global warming effects of these fuels appear to be seen as minimal.

Table 2. US CO2 Emissions from Transportation Sector Primary Sources, 2019 and 2030 Target (Million Metric Tons)

	2019	2030	% Reduction
Natural Gas	54.9	50.0	8.9
Aviation Gasoline	1.6	1.0	37.5
Distillate Fuel Oil (excl. Biodiesel)	462.0	300.0	35.1
Jet Fuel	255.7	220.0	14.0
Motor Gasoline (excl. Ethanol)	947.7	425.0	55.2
Residual Fuel Oil	32.5	32.0	1.5
Total	1,754.4	1,028.0	41.4

Source: US EIA; PKVerleger LLC.

In preparing Table 2, we examined detailed data on distillate fuel use published by the DOE. Table 3 summarizes this information. Each year, the Energy Information Administration publishes data on the adjusted sales and delivery of distillate fuel to end-users.⁶ On-highway use accounted for two-thirds of 2019 sales. Although likely incomplete due to the difficulty of making a survey of this sort, these data provide a means of projecting distillate use in 2030. In our calculations, we assumed that electrification or possibly the use of hydrogen would help reduce distillate use (primarily diesel) on the road. In 2030, distillate fuel use would decline to six million barrels per day, down from 9.3 million barrels per day in 2019 and eight million barrels per day in 2020 (see Figure 2, page 5).

The calculations also assumed that jet fuel consumers (airlines and private consumers) could achieve a fourteen-percent reduction in fuel use. No allowance was made for the possibility of significant penetration of sustainable jet fuel by 2030, although substantial progress is being made in this area.

The estimation of jet fuel use is difficult because the DOE data differ substantially from the Department of Transportation's Bureau of Transportation Statistics (BTS) data. BTS reports that jet fuel consumption for domestic and international flights in 2019 was 1.2 million barrels per day, while consumption in 2020 was eight hundred thousand barrels per day. The DOE data put jet fuel use at 1.7 million barrels per day in 2019 and 1.1 million barrels per day in 2020. The differences are likely explained by military and private jet consumption.

The assumptions of diesel and jet lead us to a finding that gasoline consumption must decline by fifty-five percent by 2030 to achieve the fifty-percent cut in emissions. This decrease would take gasoline use in 2030 to 4.2 million barrels per day, a level last recorded in 1962 (see Figure 3, page 5). The consumption in 2020 was about the same as the level allowed in 2021 if use is going to move slowly to the 2030 target.

However, use will not move slowly to the lower estimate. In fact, achieving the cut in consumption we see as needed to achieve the 2030 targets seems out of the question today without major actions by the US government.

Table 3. 2019 Distribution of US Distillate Consumption by User Group

User Group	Percent of Total Distillate Use
Residential	5.4
Commercial	3.7
Industrial	2.9
Oil Company	2.1
Farms	5.6
Utilities	0.6
Railroads	5.7
Bunkers (Marine)	3.1
Highways	67.3
Military	0.2
Others	3.5

Source: US EIA; PKVerleger LLC.

⁶ "Sales of Distillate Fuel Oil by End Use," US EIA [<https://tinyurl.com/4s9s9sxx>].

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The question is, then, what steps can be taken to bring gasoline use down quickly, presumably to be replaced by electric vehicles.

Cutting Gasoline Use

There are several major ways to lower gasoline use. Here are some possibilities:

Achieve one hundred percent electrification in “last mile deliveries” and freight movement.

Enact a new “cash for clunkers” program.

Aggressively raise the renewable fuel target for gasoline and diesel.

Electrification of the last mile delivery or even a substantial amount of freight movement could achieve hefty reductions in gasoline and diesel use. The OECD has published a study by the International Transport Forum that finds that thirty percent of all transport-related emissions of global-warming gases emanate from international transportation.⁷

A 2018 study published by the University of California at Davis provides detailed analyses of the costs and savings of electrifying deliveries in the United States.⁸ The authors do not, though, offer specific estimates of reductions in use.

The number of delivery trucks in operation in the United States is uncertain. One source puts it at 15.5 million, another at a higher figure. Many of the trucks are heavy-duty vehicles.

It seems possible, though, that there are between five and ten million vans being used in the US for deliveries and the movement of service providers such as cleaners and plumbers. If one does a rough calculation, one finds that between six hundred thousand barrels per day and perhaps as much as two million barrels per day could be saved by electrifying the entire fleet. The lower figure assumes five million trucks can be replaced with electric vehicles (EVs) and that the trucks use ten gallons per day for two

Figure 2
US Distillate Fuel Supplied: History and Scenario to 2030

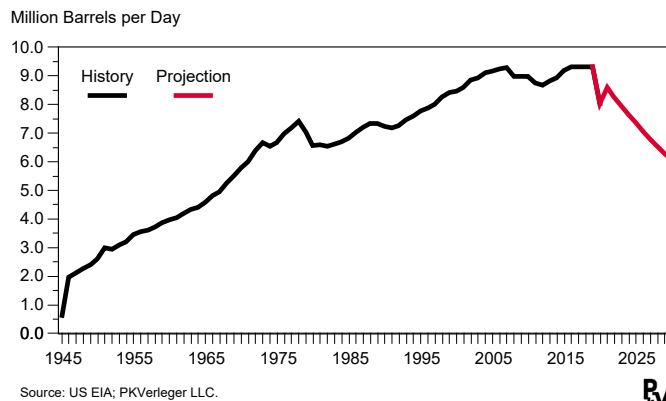
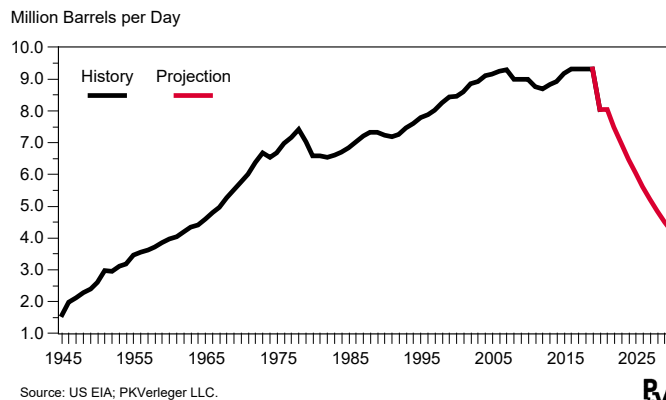


Figure 3
US Finished Motor Gasoline Supplied: History and Scenario to 2030



⁷ International Transport Forum, “The Carbon Footprint of Global Trade,” OECD, 2015 [<https://tinyurl.com/5dhenmbu>].

⁸ Miguel Jaller, Leticia Pineda, and Hanjiro Ambrose, “Evaluating the Use of Zero-Emission Vehicles in Last Mile Deliveries,” University of California Institute of Transportation Studies, 2018 [<https://tinyurl.com/f3kx3r3h>].

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hundred days per year. The higher figure assumes fifteen million trucks using ten gallons per day. The number of trucks could be even higher.

A key conclusion, then, is that electrifying the delivery system and other vans used in US towns and cities to provide services might contribute one-third or one-half of the gasoline use reduction needed.

Establishing a second “cash for clunkers” program also could produce a considerable reduction in transportation sector emissions. The “Cash for Clunkers” idea was introduced by the Obama administration as part of a program to boost auto sales. The economic benefits of the program were not great.

Economists Amir Sufi and Atif Mian examined the “Cash for Clunkers” data. They found that most cars purchased under the program would have been bought anyway within a year or two.⁹ So, as it turned out, the program itself was a clunker.

Despite the failure of Obama’s “Cash for Clunkers,” it might be possible to design a program to remove conventional internal combustion engine (ICE) vehicles from the road in exchange for EVs. There also may be a better “Stigler-type” alternative. Here, a paragraph from a 1971 article by George Stigler is appropriate:

We assume that political systems are rationally devised and rationally employed, which is to say that they are appropriate instruments for the fulfillment of members of society. This is not to say the state will serve any person’s concept of the public interest: indeed the problem of regulation is the problem of discovering when and why an industry (or other group of like-minded people) is able to use the state of its purpose, or is singled out by the state to be used for alien purposes.¹⁰

The Obama “Cash for Clunkers” did little to promote the public good. All it accomplished was to transfer sales from one period to another while helping the auto industry during a recession.

A “Cash for Clunkers” program that rewarded ICE vehicle owners with a payment if they scrapped the vehicles and replaced them with EVs would be much different from the Obama program because it would help society reduce emissions of global warming gases.

Here auto manufacturers might also follow the pattern described by Stigler by attempting to hasten the elimination of ICE vehicles. They could achieve this goal by convincing governments to tighten environmental regulations and initiate frequent inspections. A one-paragraph story published by Bloomberg in 1998 describes how Japan implemented policies that served to increase new car sales:

It is a little-known fact that Japan’s car market is propped up by the government’s strict inspection policy (“Japan’s carmakers: Time to partner or perish,” *Asian Business*, May 25). Three years after purchase, every new car has to go through an expensive inspection process, and once every two years after that. Furthermore, vehicles older than 10 years have to pass the inspection every year. As a result, most car owners in Japan write off their cars after 10 years and buy new ones. Hundreds of thousands of perfectly fine automobiles are demolished every year. This practice has been used to boost car sales in Japan and give carmakers advantages to compete in the international market.¹¹

Requiring US states to impose harsh vehicle inspections and thus boost EV sales and ICE retirements may seem out of the question to most. Farm states and states favoring deregulation (Texas, for example) would oppose such requirements.

⁹ Atif Mian and Amir Sufi, “The Effects of Fiscal Stimulus: Evidence from the 2009 Cash for Clunkers Program,” *The Quarterly Journal of Economics* 127, No. 3 (August 2012) [<https://tinyurl.com/ycds6jc8>], pp. 1107–1142.

¹⁰ George J. Stigler, “The Theory of Economic Regulation,” *The Bell Journal of Economics and Management Science* 2, No. 1 (Spring 1971) [<https://tinyurl.com/ax9rz9zd>], p. 4.

¹¹ Koshiro Yamaoka, “Why The Japanese Don’t Keep Their Cars For Long,” *Bloomberg*, June 14, 1998 [<https://tinyurl.com/p9r2c7e9>].

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Indeed, the success of a “cash for clunkers” program—or any other program requiring legislation—would encounter the sectarianism issue identified by Cohn that we noted above. The subtitle of Cohn’s article captures the challenge:

The country is increasingly split into camps that don’t just disagree on policy and politics—they see the other as alien, immoral, a threat. Such political sectarianism is now on the march.

Cohn highlights the divide between political “sects” caused in part by a reliance on different information sources. For example, he uses the debate over “canceling” some early books by Dr. Seuss as a telling illustration of one factor behind the divide:

A Morning Consult/Politico poll conducted in March found that Republicans had heard more about the Dr. Seuss issue than they had heard about the \$1.9 trillion stimulus package. A decade earlier, a far smaller stimulus package helped launch the Tea Party movement.

With this background, it is extremely hard to see how Republicans and Democrats in the US House of Representatives and Senate could agree on a program to buy back old, polluting cars, especially if most Republicans dismiss the threat of global warming. The passage of a legislative option, particularly a cash-for-clunkers program, seems unlikely.

Using the RFS program to accelerate the displacement of petroleum products may offer the best option for reaching the fifty-percent reduction goal. The Energy Independence and Security Act of 2007 set volumetric requirements for how much renewable fuel must be used in gasoline and diesel up to 2022. Section 202(a) (2) iii of the act stipulates that the EPA administrator will have the authority to set standards after 2022 based on a set of criteria. One of the criteria is global warming. If all other avenues to achieving a fifty-percent reduction by 2030 are blocked, the Biden administration could raise the blending requirements imposed on refiners and marketers beginning in 2023.

The higher renewables standard would require fueling pumps at many gasoline stations and convenience stores to be modified because most pumps can only distribute fuel with ten-percent ethanol content. The increase would also force marketers to offer a ten-percent blend for older vehicles that cannot use blends with higher ethanol content. The latter blends, though, would carry a much higher price to reflect the cost of RINs.

The RFS program, then, provides a regulatory out for President Biden if he cannot get a legislative program passed to reach his goal.

Conclusion: Oil Use Declines by More than Six Million Barrels per Day

Our title this week, “Oil in the Crosshairs,” was not accidental. Achieving the goals announced by President Biden on April 22 will require oil use in the United States to decrease by six million barrels per day or more by 2030. Many today believe this objective cannot be reached. However, an analysis of the data suggests it may be feasible if wind and solar projects continue to expand and new electric transmission facilities are constructed.

Skeptics also assert that passage of the legislation needed to reach the goal will be impossible. They are probably correct. There are tools such as the RFS program, though, that the Biden administration can use to attain its emissions target. By setting the RFS requirement high, it could accelerate the replacement of gasoline- and diesel-powered vehicles. By 2030, gasoline use could be back to levels seen seventy years earlier.