

Combined Political Action, Economic Innovation, and Technological Advancement for Greenhouse Gas Emission Reduction and Sustainability

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After Trump, the climate battle will still be challenging

US greenhouse gas emission pathways

For this article, it is useful to relate to the period from the end of 2009 to 2019, and to the period from the end of 2020 to 2030. US greenhouse gas emissions peaked in 2007 at 7416.45 million metric tons (Mt) of CO₂ equivalents (CO₂e) and then dropped sharply by about 8.9% in two years in the early stages of a recession to 6753.91 Mt CO₂e in 2009. Emissions then trended downward by about 3.1% relative to 2009 in 10 years to 6543.12 Mt CO₂e in 2019 (1, 2). This was down by another 2.8% compared to 2007.

The overall decrease of 11.7% from 2007 to the end of 2019 was realized despite several years with high GDP after c. 2011 because electricity generation by coal drifted down by about 50% from 2007, while generation from natural gas and renewables increased (2, 3).

US greenhouse gas emissions for 2020 may decrease 11% from their 2019 level mainly due to the recession, reaching 5823.38 Mt CO₂e in 2020 (4). This is down by another 9.7% of the 2007 level, bringing the decrease since 2007 to about 21.4%.

To aim for at least an estimated 50% probability that global warming will not exceed 1.5°C, or return to 1.5°C by 2100 after a low overshoot, global anthropogenic greenhouse gas emissions should be decreased to 25 - 30 billion tons CO₂e/yr in 2030 and then towards near net-zero by around 2050 (5). The target for 2030 is between 27% to 39% lower than the global emissions in 2007 (6).

The US should at least accomplish the median reduction in this range, about a 33% reduction from 2007 by 2030. This would require an additional 11.6% decrease from 2007 levels in 10 years. The decrease in Mt CO₂e per year after the coronavirus recession drop of 2020 would have to be more than 4 times faster than after the previous recession drop (11.6% versus 2.8%).

The additional decrease would be c. 14.8% of the 2020 level. This decrease relative to the initial 2020 level would have to be around five times greater than the previous decrease relative to the initial 2009 level of 3.1% (14.8% versus 3.1%).

In 2018 most of the US greenhouse gas emissions came from transportation (28%), electricity generation (27%), industry (on-site industrial emissions, 22%; (7)). These percentages are probably close enough to the 2020 percentages, to make rough estimates.

Reduction in emissions from the electricity sector might be the easiest to achieve. The 14.8% reduction from year 2020 is about 55% of the 2020 emissions from this sector. Consequently, the reduction can be approximately achieved by replacing roughly half of the natural gas generation with renewables and replacing all coal with natural gas, and serving any increase in electricity demand with renewables - provided that emissions in the other sectors do not increase (2, 7, 8).

Manufacturing and installation of the new renewable technologies and possibly, improvements to the grid if storage does not advance enough, would emit greenhouse gases, but this would be along the way to 2030 and therefore be allowed in the emission mitigation pathway.

Federal stimulus legislation that encourages a broad spectrum increase in economic activity - as opposed to concentration on the needed transition - could make emission reductions more challenging.

The political history

In recent years, the political process in the US on the federal level has been resistant to improving environmental policy. Since the 1960s and 70s, when great progress was made, including the creation of the EPA in 1970, policy progress has been disappointing.

Under Democratic Presidents since the 1970s, the US joined two climate agreements, the Kyoto Protocol and later the Paris Agreement. However, participation was withdrawn by Republican presidents, Bush II and Trump, both known as anti-environmentalist administrations. Trump has worked to reduce other initiatives, too, while state and local governments have pursued additional initiatives (9). Funding for renewable energy technologies and efficiency research was increased substantially a couple of times since the 1970s (10).

Outlook for US federal policy to encourage emission reductions

Joe Biden will probably win and take office in early 2021. Except for the coronavirus, some things will be similar and some things different compared to when Barack Obama took office in 2009.

The Democrats will probably gain a slim majority in the US Senate, less than their 2009 majority. Recall that senators of both parties stopped Obama's climate legislation in 2010 when the Democrats had a solid majority. The Senate has a rule of requiring 60 votes just to allow a vote on most matters.

A majority (about 60%) of the US public considers climate change to be a "major threat" compared to 44% in 2009 (11).

The fossil fuel industry continues to greatly outspend the renewable energy industry and environmental groups on political campaigns (12).

Biden would be free to take unilateral executive action, as Obama did in 2014. Research spending might increase. If the Democrats keep the House, there may be a repeat of what happened to Obama's climate legislation. But with enough advocacy, some further policy might pass that would be weakly helpful. At the time of this writing though, it is uncertain if the Democrats will keep the House.

Direct action for a new direction

There is a chance for progress even without a federal policy boost. Government grants and subsidies for sustainable technologies and behavior create, distribute, and direct economic power to increase the development and deployment of these technologies, and encourage good behavior beyond what would likely happen in the consumerist market. The coronavirus recession calls for and provides an opportunity for nongovernmental action to supplement, or substitute such governmental action.

The economic power to be created, selectively distributed and directed would be in the form of a supplemental or alternative electronic medium of exchange or currency, given value by a group of producers agreeing to accept it, including solar PV manufacturers and installers. The participants would accept and use the currency in conjunction with US Dollars (13).

The currency would be issued to individuals and the producers by a governing entity, preferably democratically controlled. To accelerate research, development, and deployment of sustainable technologies such as solar PV, grants of the currency would be issued for leasing and purchasing solar PV installations and more environmentally friendly transportation such as electric vehicles. US jobs

for building and installing the technology would be created and exports of PV from China, where coal use is higher, would decrease, which could reduce emissions. Society must become more humane and just as well as sustainable, so grants would also be made for other purposes. Grants would be issued during a growth phase of a system until it is mature.

The proposed system is part of a project that integrates multiple objectives, The Discovery Solar New Economy Project: markpve.wixsite.com/earthcommunity2.

Gently reversing the growth of civilization will require systemic change (14). If civilization does not collapse before such change can begin, it will probably get started during hard times. Therefore, a network of ecological-social currency systems could arise. Otherwise, the next crisis might disable civilization.

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