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The Choice of Actions to Address Climate Change: Issues and Challenges

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Recognition that the survival of the planet depends on urgent action to address climate change is growing daily. Media attention and discussion increased steadily with the December climate negotiations, COP26 in Glasgow, Scotland. The frequency of climate disasters including the devastating wildfires in Colorado, tornadoes in Kentucky, and hurricane Ida in Louisiana ensure continued public attention. According to a recent Washington Post analysis, 40 percent of Americans live in counties hit by climate disasters in 2021.[1] Predictions are this trend will become much worse in the years to come. Assuming, as is almost certain, 1.5°C of warming above preindustrial levels by 2030, almost half of the world's population—approximately 5.0 billion people—could be exposed to a climate hazard related to heat stress, drought, flood, or water stress.[2]

So what to do?

The Five Strategic Options for Reducing GHG Emissions

The growth in attention to the issue has been met by a corresponding increase in proposals for what to do. While a growing number of countries have announced "net zero" targets for 2050 with interim goals for 2030, how this will be achieved remains ill-defined. Five of the strategies most discussed, in the U.S. but also globally, are discussed below, with a brief comment on challenges to their effective implementation. While each of these options is analyzed individually and in isolation, in practice each must of course be considered in relation to the larger policy context in all its dimensions.

1. *Carbon taxes or pricing* to encourage reductions in use of fossil fuels, are the preferred

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Citation: Miller, A. (2022). The Choice of Actions to Address Climate Change: Issues and Challenges. *Academia Letters*, Article 4805. https://doi.org/10.20935/AL4805.

approach of economists including the Nobel Laureate William Nordhaus[3] as well as the climate scientists and activist Jim Hansen. Such policies have been enacted in several states and many countries,[4] although not at the levels economists say are necessary to limit warming. Many companies support carbon pricing,[5] although some as part of their opposition to climate regulation[6] and with some confidence a carbon tax will not pass Congress.

Challenges: To be effective in reducing GHG emissions, carbon taxes need to be high and predictable. Raising any tax engenders political opposition, especially on highly visible consumer goods like gasoline. Thus, President Biden's efforts to lower recent oil price increases even as he otherwise promotes fossil fuel reduction.[7] Carbon tax advocates including Nordhaus also acknowledge that market mechanisms are only a partial answer and must be supplemented by regulation. Consideration should be given to more creative approaches to bring about public acceptance, e.g., taxing automobiles based on fuel efficiency with rebates for highly efficient models – an approach approved by the Maryland legislature many years ago but never implemented.

2. *Massive investment in new technologies and innovation* is the core of initiatives announced by billionaire Microsoft founder and philanthropist Bill Gates[8], banker Mark Carney, and other financiers. While a major cost, Gates sees this as an opportunity for the U.S. insofar as "The countries that build great zero-carbon companies and industries will be the ones that lead the global economy in the coming decades." The infrastructure program approved by Congress in August included tens of billions for applied R&D and technology demonstration programs at the Department of Energy. Climate-related provisions in the Build Back Better bill still under discussion would approve billions more.[9]

Challenges: As noted, the prospect for Congressional approval of billions more public funds for climate related R&D is in doubt. There is also opposition to some potentially climate friendly technologies, e.g., new nuclear power plant designs,[10] and in the case of others, social and environmental trade-offs, e.g., dependence on countries with poor human rights records for cobalt used to make batteries.[11] The time required to bring truly innovative products to scale is also an issue; as climate activist Bill McKibben points out "if we don't make huge progress in the next 10 years scientists have made clear we can kiss the targets we set in Paris goodbye."[12]

3. *A commitment to a global scale, rapid acceleration in one or both of two strategies*, *a shift from fossil fuel to renewable energy sources for generating electricity and planting trees*. Renewable energy advocates note the dramatic price reductions in solar, wind, and battery technologies and cite analysis from Stanford concluding that virtually every country could achieve 80 percent generation from these sources by 2030.[13] *Reforestation on a massive scale* is one of a range of proposals for nature-based solutions to climate change and has

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many advocates.[14] While considerable scientific knowledge must be applied, typically no new technology is required and many other environmental and social benefits are attainable. One detailed analysis concluded currently available land provides space for increasing forest cover by 25 percent with the potential to absorb and store a similar percentage of the carbon currently in the atmosphere.[15]

Challenges: (a) Because of their intermittency, reliable generation of electricity today usually requires some backup with hydropower or gas.[16] Battery storage is becoming an option and costs are declining, although currently still expensive. Extension of power lines is also an issue. Investments in solar and wind power are increasingly facing resistance from local landowners and vested interests in continued use of coal and natural gas. The U.S. lacks a national authority with the power to mandate this transition, and Senator Manchin, a key vote in the equally divided Senate, earns large amounts from a stake in the coal industry and opposes proposed incentives to accelerate the transition. (b) Proposals for reforestation on a massive scale must overcome the reality that large scale tree planting programs have a very mixed record, in part due to the added stress from climate change.[17] Setting aside land for conservation may conflict with demand for agriculture and urban expansion, and many locations suitable for reforestation are also in countries where substantial donor funding would be required.

4. *Climate friendly behavior changes* like eating a more plant-based diet, reducing food waste (a source of methane released by landfills), less dependence on air conditioning, and greater use of public transportation could make a significant difference in GHG emissions. Over 70 percent of global GHG emissions come from household or "lifestyle" consumption.[18] Such changes have largely been left out of policy discussions and climate modeling because they are more difficult to quantify and may be seen as likely to generate resistance, although the commercial introduction of plant-based alternatives to beef has led to much greater focus on the role of diet as a contributor to climate change.[19]

Challenges: While there are precedents for public promotion of behavior change for individual benefit (e.g., health warnings on cigarette packages and wearing seat belts), the recent resistance to COVID vaccination demonstrates the challenge to advocating behavior for societal benefit. One challenge to the package of climate proposals called the Green New Deal was the assertion that "they want to take away your hamburgers."[20]

5.For a growing community of climate activists, the answer to climate change is *fundamental reform of the political system*.[21] An oft heard slogan is "system change, not climate change."[22] The author and social activist Naomi Klein, defines the concept as a reform of capitalism to de-emphasize the singular focus on growth as traditionally measured and to reduce the power of the fossil fuel industry. Swedish climate activist Greta Thunberg similarly

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argues *"The climate and ecological emergency is, of course, only a symptom of a much larger sustainability crisis. A social crisis. A crisis of inequality. . . . It's all interconnected. It's a sustainability crisis that everyone would benefit from tackling."*[23] What this means and requires is the subject of a growing literature, if not yet serious political debate.[24]

Challenges: current absence of public support

Adding to the challenge associated with all five approaches is the need for global cooperation and coordination. Accelerating use of solar and wind power is most needed in China and India where coal use is greatest; changing dietary choices matters most in the U.S., Australia, and other wealthy nations with high meat consumption. These measures are of course also not mutually exclusive; carbon pricing would encourage behavior changes, and some fraction of the funds generated could be directed toward investment in research and demonstration and measures to reduce inequality.

Unfortunately, as weather extremes and climate disasters occur more frequently and with greater consequences, the time for deliberation is rapidly diminishing. The answer increasingly would seem to be all of the above, as fast as possible.

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