TECHNOLOGY

Learning to Live With Fossil Fuels

We can't address climate change without carbon reduction, but we also can't afford to neglect a vital second option: carbon capture.

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TODAY, MORE THAN 85 PERCENT of the world's energy still comes from fossil fuels. Despite centuries of growing use, these fuels remain abundant. Powerful economic and political interests are organized around the fossil-energy system, as are complex social arrangements (consider, for example, the dependence of rapidly expanding cities on conventional electrical grids).

These realities have made a mockery of the 20-plus years of international efforts to wean the world off oil, coal, and natural gas. That doesn't mean we should stop trying; when it comes to climate-change mitigation, a shift to carbon-free energy remains the Platonic ideal. Yet it is past time to acknowledge that on any given day, "Drill, baby, drill!" is in fact a highly effective strategy for continuing to deliver the many benefits of cheap energy.

As a result, it's also past time to explore more seriously a parallel path to reducing greenhouse gases—one focused not on moving off fossil fuels, but on capturing the carbon that these fuels emit.

Carbon capture is not a new idea; technologies that can start us down this path are proven and available. They are also expensive—at least for now. Yet the political and social hurdles to are far lower than those to abandoning fossil fuels, and demonstrable progress is far more certain, provided we make the right investments.

We already know that carbon can be removed immediately at its principal emissions sources: coal- and gas-fired power plants. Various chemical processes, some of which are already widely adopted for industrial applications (such as producing hydrogen and ammonia), can remove up to 90 percent of power-plant emissions, although they have yet to be deployed on a large scale. And while capturing carbon from coal plants is estimated to raise the cost of generating electricity by between 30 and 80 percent, costs can be reduced by recycling the captured carbon dioxide for commercial purposes, such as pumping it into oil fields to recover more oil, a technique in use since the 1970s. Continued innovation will lower costs further. Substantial government investment is focused on this goal—since 2008, the U.S. government alone has spent nearly $6 billion—but we'd do well to invest more.

In fact, we should go further still—by pursuing new technologies that can sponge carbon directly out of the atmosphere. So far, relatively little R&D has been devoted to air capture—a few small companies and university researchers are exploring the possibilities, with some support from venture-capital firms and the Gates Foundation—but the underlying scientific principles are the same as for carbon removal at power plants. The challenge is to design systems that can be scaled up to remove significant amounts of carbon dioxide from the air, where it is far less concentrated than in the smokestacks of coal plants.

While the cost of air capture is largely speculative—current estimates range from $20 to $2,000 per ton of carbon dioxide removed—it appears to be comparable with the equally speculative cost of moving the global energy system off fossil fuels and onto renewable energy resources, which might reduce global GDP by several percentage points.

Captured carbon needs to be stored, or converted into products, or even recycled into methanol and other fuels. Experience using carbon dioxide to recover oil shows that large volumes of the gas can be stored underground without significant leaks, but ultimately, demonstration projects will be necessary to ensure that the carbon we capture doesn't find its way back into the atmosphere.

Driving down the costs of carbon capture in the coming decades will require large government investments, not only for more research, but also to procure and deploy the technologies at scale. The climate is, of course, a public good; governments (and taxpayers) should fund a large part of any carbon-capture effort, just as they have funded other important public works. If such a commitment seems implausible given the sorry state of climate politics, consider that the U.S. and China—viewed by many as the main villains in the failure of international climate policy—are already engaged in significant public-private partnerships intended to demonstrate full-scale, commercially viable carbon capture at coal-fired energy plants in Texas and in Xinjiang, China.

Indeed, the greatest promise of carbon capture is how it could transform the political debate. Unlike abandoning fossil energy, capturing carbon does not demand a radical alteration of national economies, global trade, or personal lifestyles. It does not threaten the ambitious development aspirations of China and other poor countries. It enfranchises the very groups that have the most to lose from conventional climate policies—from powerful corporate interests to many of the world's poorest people.

Ultimately, giving up fossil fuels simply may not be feasible, so we must explore alternatives. Carbon capture alone will not be enough to address climate change, but moving it toward the center of the energy-policy agenda will open up new opportunities for making real progress in the near future.

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