Decarbonizing the US Economy:
Pathways Toward a Green New Deal

SAMPLE POLICY: BUILDING A HIGH-CAPACITY NATIONAL GRID

INTRODUCTION

The climate crisis is here. According to the UN Intergovernmental Panel on Climate Change, limiting climate change to 1.5°C—and avoiding some of its most harmful impacts—would require a 45 percent cut in human-caused CO_2 emissions by 2030 and carbon neutrality by mid-century. We argue that decarbonizing at this rapid pace is not only possible, but that it will improve our economic outlook, create jobs, and promote equity. Such an endeavor, however, necessitates immediate action and a broad range of policy tools. In *Decarbonizing the US Economy: Pathways Toward a Green New Deal*, we outline the three pillars of such an approach: 1) carbon pricing that promotes an equitable transition while meeting our emissions goals; 2) comprehensive regulations to redirect private spending and to ensure climate targets are met; and 3) large-scale public investments.

Solving these sizable problems will require a sizable actor: government. To change the everyday decisions of businesses, individuals, and communities, and to provide a true alternative to the dirty "business-as-usual" economy, we must put a price on carbon and deploy direct environmental regulation. Though necessary, regulations and carbon pricing alone will be insufficient to meet the scale of the challenge and to address the dislocation associated with decarbonization. Carbon pricing and regulation may reduce fossil fuel extraction, for example, but they won't ensure that workers in carbon-intensive industries find quality jobs; they may reduce transportation-related emissions, but they won't offset increased driving costs or expand access to alternative modes of transit. Fortunately, the choice between decarbonization and meeting other social needs is a false one. A rapid transition to a carbon-neutral economy will raise living standards for the majority of Americans.

We must rewrite the rules of our economy to promote a rapid and equitable transition, with an increase in public investment at the core of such an undertaking. To transform our economy on the scale that a Green New Deal would require, we need a large degree of coordination—coordination that can and must be directed by the government. While the economics of decarbonization are often misunderstood as a problem of *scarcity*, in which doing more to avert climate change means doing less to meet other social needs, we argue that a more robust public sector to facilitate this transition is both affordable and attainable.

In *Decarbonizing the US Economy*, we outline a set of policy proposals that demonstrate how we can decarbonize the economy in ways that promote growth and ensure equitable outcomes. These sample policies show that decarbonizing the US economy can create quality jobs, reduce inequality, and tackle the existential threat of climate change. Here, we explore one of these policies: building a high-capacity national grid.

SUMMARY

As the economy transitions towards carbon neutrality, the electricity sector must be fully transitioned to clean and renewable energy sources. The US currently lacks a comprehensive national grid, and the grids that do exist are outdated and poorly designed to transport large amounts of renewable energy across long distances. This is a major obstacle to a 100 percent shift to renewables, since major renewable sources—wind and solar—are intermittent, or more available at some times rather than others. The intermittency problem is made much worse by the limits on long-distance energy transmission—when renewables in one region fall short of meeting its needs, the existing grid cannot easily transfer energy from long distances. Decarbonizing the electricity sector will require significant improvements in long-distance energy transmission. In this subsection we propose building out a high-capacity national grid to address the intermittency problem.

BACKGROUND

The electricity sector currently contributes 28 percent of US GHG emissions, putting it just behind the transportation sector as the largest emitter (EIA 2019a). To decarbonize the economy, emissions in the sector will have to be rapidly drawn down to zero as the grid transitions from a mix of fossil fuels (63.5 percent), nuclear (19.3 percent), hydro (7 percent), and renewables (10.2 percent) to all clean and renewable energy as soon as possible (EIA 2019a).

Perhaps the largest obstacle to fully decarbonizing electricity generation is not generation itself, but the grid. Renewable electricity is already cost-competitive with fossil fuels; coal-fired plants continue to be decommissioned, while solar and wind capacity is rising rapidly. The fundamental problem is not building up renewable capacity, but intermittency: wind and solar power generation depends on weather conditions. And electricity, unlike most other commodities, cannot be easily stored at industrial scales — it must be generated when it is used. This would not be a great problem if we had a genuinely national or, better, global grid - the wind is always blowing, and the sun is always shining, somewhere. But in the US, long-distance transmission is quite limited. New York City, for example, must meet 80 percent of its electricity needs from power generated within the city itself (Walawalkar, Apt, and Mancini 2007).

As long as electricity can neither be economically stored nor transmitted across long distances, there is a limit to the share that can be provided by renewables. There must be “dispatchable” power, which can be ramped up or down at short notice, to meet demand when renewable sources are offline. In practice this means fossil fuels, primarily natural gas with some form of carbon capture. Some fossil fuel plant may operate just a few days a year, at moments of peak demand.

In the long run, improved storage technologies may resolve the intermittency problem. These technologies, however, are just starting to be deployed at large scale. Improved transmission, on the other hand, is technologically straightforward; it simply requires investment to greatly raise the capacity of the existing grid and integrate it nationally (and eventually internationally). At a national scale, wind patterns are negatively correlated, meaning when the wind blows in one area, winds tends to die down in another. Similarly, the sun rises a few hours earlier on the east coast while it sets a few hours later on the west coast. Integrating the national grid greatly reduces the chance of major mismatches between power demand and renewable supply (Mills and Wiser 2010). This currently requires an available source of dispatch able (usually fossil-fuel) power.

Building a national grid that allows for energy to move across long distances could drastically cut carbon emissions

while also saving consumers money, but it will require federal action (MacDonald et al. 2016). There have been proposals for a true national grid for decades. But as renewables' share of capacity grows steadily, the need for this new infrastructure is ever more pressing (NREL 2018; Friedlander 1968; Abraham 2002). Only a national grid can allow renewable energy sources to move toward 100 percent in a timely manner without the need for back-up fossil fuel plants for dispatchable power.

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While the existing utility sector is well aware of the benefits of a national grid, they have failed to build a national grid for a number of reasons. Perhaps the fundamental obstacle is the coordination it would require across states and various utility companies (Roberts 2018). Siting the project has proven to be incredibly challenging, as has deciding who will foot the bill. The federal government is the only entity that could plausibly overcome these coordination problems. Similar examples can be found in other countries, such as China, which is already moving ahead with the buildout of a national power grid, demonstrating that the primary hurdle is not technological (*The Economist* 2017).

Other reforms to the electricity sector should be considered by policymakers. For instance, the current utility model is woefully outdated and currently structured to oppose the buildout of renewable energy and the decentralization of the grid. This model, which arose as a grand bargain, created a business model in which utilities largely operate as state-protected and state-regulated monopolies. Most of these monopolies operate within a cost-of-service-rate (COSR) model, which was designed to primarily run on fossil fuels. COSR requires utilities to sell power to ratepayers without a markup, and profits for utilities arise from their capital investments (i.e., building more energy infrastructure). While this model was effective in the 1930s, when incentives were needed to rapidly build out infrastructure to provide electrification across the country, COSR is poorly designed to motivate utilities to serve customer demands for renewables and facilitate a transition away from the current fossil fuel economy due to the problem of stranded assets—replacing existing profitable fossil fuel infrastructure—and stagnant electricity demand (Aas and O'Boyle 2016). One possible solution is for the public sector to take control of electric utilities. Running these in a truly democratic fashion would help meet our climate goals, achieve climate justice, and better serve everyday customers (Alperovitz andBozuwa 2019; Koeppel, Bozuwa, and Veazey 2019).

SAMPLE POLICY

While the full decarbonization of electricity generation will require a variety of policies, such as a carbon cap-and-dividend and renewable electricity standards, the construction of a high-capacity national grid is a key part of achieving rapid decarbonization of the power sector. The federal government should undertake the funding and siting of a national grid that utilizes long-distance, high-capacity DC power lines to connect the US.

The US government should rapidly invest the estimated $70-80 billion required for new, high-capacity, long-distance power lines (Bloom 2018). The government should also be responsible for assisting in the coordination of transition line placement across state lines, perhaps simply following the interstate highway system.

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