Mobilizing Political Action on Behalf of Future Generations

Joseph E. Aldy

Summary

Our failure to mobilize sufficient effort to fight climate change reflects a combination of political and economic forces, on both the national and the global level. To state the problem in its simplest terms, writes Joseph Aldy, future, unborn generations would enjoy the benefits of policies to reduce carbon emissions whereas the current generation would have to bear the costs. In particular, incumbent firms—politically influential fossil-fuel companies and fossil fuel–intensive industries, which are now reaping substantial returns from a status quo that fails to address climate change—might face significant losses from policies that discourage carbon emissions. On the other hand, insurgent firms—companies that are investing in low- and zero-carbon technologies—stand to gain.

Aldy analyzes durable, successful public policies in US history whose costs and benefits accrued to different groups—the 1935 Social Security Act, the 1956 Interstate Highway Act, and the 1970 Clean Air Act Amendments. Those policies differ from climate change policy in important ways, but they nonetheless offer lessons. For example, designing climate policy to deliver broad, near-term benefits could help overcome some of the political opposition. To do so might require linking climate change with other issues, or linking various interest groups. We might also win support from incumbent firms by finding ways to compensate them for their losses under climate change policy, or use policy to help turn insurgent firms into incumbents with political influence of their own. Finally, we might account for and exploit the veto points and opportunities embedded in our existing political institutions.

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From almost any perspective, our efforts to confront the risks posed by global climate change have been insufficient. Since the international community first negotiated a treaty focused on climate change in 1992, global carbon dioxide emissions have increased more than 60 percent.[1] President George H. W. Bush agreed to limit US emissions to 1990 levels by 2000, President Bill Clinton agreed to cut US emissions to 7 percent below 1990 levels by 2010, and President Obama has called for an economy-wide cap-and-trade program to lower emissions more than 80 percent by 2050, yet their stated intentions haven't produced substantive policy. Economic analyses suggest that the benefits of incremental reductions in greenhouse gas emissions greatly exceed the current explicit or implicit price to emit a ton of greenhouse gases by almost all emission sources around the world.[2] Environmental advocates call for limiting warming to no more than 2 degrees Celsius (3.6 degrees Fahrenheit); academics question whether such a goal is still feasible.[3]

The failure to mobilize sufficient effort to combat climate change reflects the difficult political economy (that is, the interplay between politics and economics) that characterizes the problem. Mitigation of emissions (1) yields a global public good that no individual, firm, or country has a strong incentive to produce unilaterally; (2) imposes near-term costs with benefits spread over centuries; (3) risks exposing domestic firms to adverse pressures from foreign competitors; (4) delivers unclear returns, given uncertainties about climate science, multilateral coordination, market behavior, and technological innovation; and (5) requires fundamental transformation of the energy foundation of modern industrial economies. Moreover, the distribution of climate change policy's benefits and costs varies across space and time, as well as among various political constituencies and special interests.

To grossly simplify the problem, the challenge is that future, unborn generations will enjoy the benefits of climate policy, whereas the current generation, in particular those reaping substantial returns from a status quo that fails to address climate change, will bear the costs. Even if that challenge could be overcome, what kinds of investments in protecting the global climate should we make? Nobel Prize–winning economist Thomas Schelling's observation on the eve of the 1997 Kyoto Protocol conference provides some context: "The future beneficiaries of these [climate change] policies in developing countries will almost certainly be better off than their grandparents, today's residents of those countries."[4] Like many other economists, Schelling says continued investment in productive physical capital and knowledge creation will make possible a better standard of living for future generations. In effect, unborn generations will enjoy the benefits of investments made today. Children alive today, however, may bear substantial costs associated with mitigating climate change. Given the discretionary nature of much public spending on children—relative to adults and, especially, older people—the costs borne by children today could be disproportionately large.

Thus investing in global climate protection may further enhance future generations' quality of life, but it comes with costs that merit consideration. First, investing in emissions mitigation may reduce the resources available to invest in other forms

of capital that the future may value. Second, investment of any kind today represents forgone consumption among members of the current generation, including children.

The current dearth of meaningful investment in climate protection indicates that more climate investment is called for. But the increase in investment shouldn't be random. Going all in on climate protection would not necessarily make future generations better off. Instead, a prudent approach to investing capital, defined in a very broad sense (physical capital, human capital, environmental capital, social capital, etc.), can ensure that future generations enjoy a standard of living at least as good as that of the current generation. Maintaining if not increasing the capital stock in its broadest sense requires that we use analytic tools to identify the social returns on various kinds of investments—including investments in climate protection—and then translate the results of those analyses into policies that can guide shifts in current economic activity so as to maximize the social returns on investment in capital, writ large.

That formulation of the problem leads to the standard economist's prescription: "Get prices right." Putting a price on the damage that carbon emissions cause to the environment, the economy, and human wellbeing could align private returns on investment with social returns on investment. Such a prescription, however, must confront the political fact that the costs of changing prices would be borne primarily by the current generation, whereas the benefits would be enjoyed disproportionately by future generations. Moreover, the current costs are concentrated among politically influential firms whose existing capital imposes net adverse effects on the global climate; economists call them *incumbent* firms. In contrast, as newcomers to the market, emerging, *insurgent* firms—those with new and potentially disruptive technologies intended to deliver low- and zero-carbon goods and services that could capture incumbents' market share—have less political power. Given that incumbent firms have long experience in using policy and regulatory processes to their own ends, designing a policy that would enhance the influence and investments of insurgent firms to deliver climate benefits to children today—as well as to future generations—represents a tall challenge.[5]

The Economics of Sustainability

To frame the political challenge of mobilizing effort on climate change, let's consider the returns on two different types of capital and the incentives for trying to influence policy. First, let's define business capital as appropriable physical and human capital associated with private firms. Second, let's define societal capital as a much broader concept that includes natural capital, such as the global climate; social capital; and knowledge, which can be thought of as a form of nonappropriable human capital.

Given current policies and laws, the agents responsible for managing business capital make decisions to maximize the return on that capital. They decide on procurement of equipment, hiring of personnel, marketing expenditures, and the like. They may also decide how to engage in policy debates. Industry attempts to shape, influence, and capture regulators and policy makers in order to maximize the returns on its capital.[6] This is true in an array of contexts, from antitrust policy to trade policy to environmental policy.

Why focus on firms?

Under climate change policy, firms will have to invest in new technologies to demonstrate compliance with government regulations. Because such compliance costs are typically concentrated in fossil fuel businesses and certain emission-intensive industries, those kinds of organizations—as they have in the past—will play very active roles by engaging political leaders of both parties as well as regulators in order to shape and/or delay climate change policies to accommodate their interests. Consumers' more disparate interests will likely motivate less political participation and lobbying than firms with assets at risk would undertake.

Some of the agents who manage incumbent firms may actively oppose policy proposals—such as regulating greenhouse gas emissions or pricing carbon—because, they say, such policies could reduce the return on their capital. Indeed, they may consider it their fiduciary responsibility to the owners of the firm to allocate resources to oppose climate protection policy. This stylized representation of "business capital" is characterized by (1) incumbents in the market economy (that is, those with existing capital) and (2) firms whose net effect on climate is adverse (on whom any regulation to reduce climate change risks would impose net costs).

Agents of insurgent firms may support climate protection policy proposals because such policies would expand markets for the goods and services they produce. Insurgent firms tend to be relatively new entrants, especially in energy markets, that are developing innovative and potentially disruptive technologies. They compete with the incumbents and aim to capture some of the incumbents' market share, which creates an incentive to try to influence policy.

In the context of climate, much of the incumbents' relevant business capital of fossil fuel extraction and energy production firms are assets whose value could fall—potentially dramatically—with emission mitigation policies. Coal-fired power plants, commercially developed oil fields, and natural gas pipelines all could become stranded assets if climate policy significantly reduced the use of fossil fuels. That possibility creates a strong incentive for the owners of such assets and their managers to oppose such climate change policies, absent some form of compensation. Because fossil fuels vary in their carbon intensity—for example, coal is almost twice as emission intensive per unit of energy as natural gas is—modestly ramping up climate change policy could benefit natural gas at the expense of coal. Over the longer term, as climate change policy becomes more ambitious, it could benefit renewable and nuclear energy at the expense of natural gas. This situation suggests that fossil fuel producers might not act as a monolithic bloc in opposing and/or shaping climate policy.

The second, broader type of capital effectively includes all resources left for the next generation.[7] Thus it includes the business capital described earlier as well as other forms of capital that markets either imperfectly or incompletely value, such as natural capital (including the global climate), social capital, and technological knowledge. This broader definition of capital is more closely associated with people's wellbeing than are narrower, market-oriented definitions.[8]

Policy Implications

Describing capital in this manner has several important policy implications. First, given

the various kinds of capital under this broad umbrella, opportunities exist to substitute one kind of capital for another. Future generations might be better off with more climate-related capital and less energy-related physical capital; on the other hand, a small increase in climate capital and a dramatic decrease in physical capital could make them worse off. Investing in natural capital would mean forgoing investment in other kinds of capital. Related to that trade-off, investing the returns from drawing down one form of capital can ensure that consumption doesn't decrease across generations.[9] For example, the extraction of nonrenewable resources results in less nonrenewable resource capital. If those returns are consumed by the current generation instead of invested in other forms of capital, then the nonrenewable resources may deliver a short-term bump in consumption that will fall as the returns on resource extraction decline with the asset base. Likewise, if drawing down "climate" capital by burning fossil fuels yielded returns that were subsequently invested in new knowledge, then future generations might be no worse off than the current generation—even with some climate damages. It's unlikely, however, that the market is currently delivering optimal investment in line with such thinking.

The broad approach to capital that includes all resources left for the next generation has been referred to as the *economics of sustainability*. Though I won't explore in detail the ethics of our responsibilities to future generations (as well as to our contemporaries), a generally benign formulation of our obligations has been to leave the future with opportunities for consumption no worse than those our generation has enjoyed. Some economists call this *weak sustainability*, because it allows for substitution across various kinds of capital; they contrast it to *strong sustainability*, which calls for maintaining capital in each category. Underlying the concept of weak sustainability is the idea that a small reduction in one type of capital can be offset by a small increase in another type of capital.

Second, as the stock of capital in any given category decreases, the returns to investment in that kind of capital are likely to increase. In other words, different kinds of capital are roughly interchangeable, but there are limits to substitution. A decline in climate capital that produced catastrophic impacts would make future generations worse off regardless of the returns on other forms of capital. A policy framework that accounts for how changes in each kind of capital alter the returns on incremental investments can account for those limits to substitution.

Third, given strong private incentives to invest in traditional business capital and very weak private incentives to invest in natural capital (combined with inadequate public policy to correct those incentives), the returns on incremental investment in climate protection likely exceed the returns on incremental investment in business capital. Policies that can better align incentives for investment in natural capital can help correct the imbalance, as described in the next section.

Fourth, uncertainty in returns on capital and potential differences in the uncertainty in returns across different types of capital will influence investment decisions. Typically, the greater the uncertainty (or variation) in returns, the larger the expected return necessary to justify an investment. Moreover,

uncertainty about the benefits of a policy can reduce the level of public support and make it less likely that policy makers will take action.[10] Incumbents face a variety of uncertainties in a conventional business investment, but uncertainty regarding returns on climate policy is likely much greater, given uncertainties in the science, in technological innovation, in future policies, and in the extent to which other countries around the world will mitigate climate change.

Stakeholders can influence uncertainty. Some—in an effort to delay policy action and investment in climate-friendly technologies—may undertake communication campaigns that emphasize the uncertainties in climate change.[11] Others may call for investing more in the basic science and holding off on policy prescriptions until the research findings are realized; that was the Reagan Administration's approach to acid rain. Of course, businesses make investment decisions every day in the face of uncertainty and risk, which raises the question of why the uncertainty about climate change justifies putting off action. Indeed, businesses often look for ways to hedge risks when making decisions in uncertain environments. In the climate context, some have done so by simultaneously questioning the science of climate change—hoping to delay policy action—and investing in new resources and technologies (for example, shale gas) whose returns would likely increase under policies to mitigate climate change.

Finally, the prospect of abrupt or catastrophic climate change could result in large, discrete falls in consumption and wellbeing and violate that assumption in the weak-sustainability paradigm.[12] In such a case, a strong sustainability framework based on maintaining or enhancing the status quo climate could be justified. The key question is how policy choices could influence the magnitude and/or likelihood of catastrophic climate change. For example, reducing uncertainty about the timing and scale of abrupt and catastrophic climate change could help spur the multilateral collective action necessary to avoid crossing a threshold into a climate catastrophe.[13] Yale economist William Nordhaus suggests that policy makers could react to the potential for catastrophic climate change by investing in geoengineering technology, such as by injecting sunlight-reflecting particles into the upper atmosphere to cool the planet and offset global warming.[14] Geoengineering to prevent catastrophic climate damages, although unproven and controversial, could effectively return the framework for climate policy to the marginal trade-offs in investment and consumption associated with weak sustainability.

Refocusing investment from traditional business capital to capital in the broader sense could promote sustainability. But to do so would require public policy intervention because private firms don't bear the societal costs that their emissions impose through climate change. How should we consider future generations' interests in developing such policies, and how should we engage the two kinds of business capital—incumbents and insurgents—in building political support for climate policy?

Cost–Benefit Analysis and Future Generations' Interests

Cost–benefit analysis is a decision tool that can evaluate various public policy options for correcting a market failure—such as greenhouse gas emissions—in much the same way that private investors assess options

for allocating their savings. The policy maker who pursues the option that maximizes net social benefits delivers the outcome that would be expected in the market if it were not characterized by the market failure (that is, if private and social returns were identical). In practice, many cost–benefit analyses are narrow assessments of a specific policy in a specific sector. But we have a number of modeling approaches that permit dynamic evaluation of the economy-wide impacts of climate protection policies. As a result, we can clearly draw a connection from the outputs of a cost–benefit analysis—which could be described as a societal investment policy—to the economic sustainability framework outlined earlier.

In the context of a greenhouse gas mitigation policy, cost–benefit analysis typically shows (1) near-term costs associated with reducing emissions and (2) long-term benefits associated with reducing the risks posed by climate change. Given that most greenhouse gases have long atmospheric lifetimes—on the order of hundreds to thousands of years—the benefits of a climate change policy could accrue to many generations in the future. This framework permits an accounting of the streams of benefits and costs over time by applying a discount rate to convert benefits and costs that occur in various periods of time into a single, present-day measure. A discount rate reflects the fact that an individual typically values a dollar of consumption today more than a dollar of consumption in the future; for example, we could invest a dollar today, and its returns would provide more than a dollar in the future. A relatively low discount rate—which means that a dollar of consumption in the future is almost as valuable as a dollar of consumption today—effectively places greater weight on the impacts of climate policy that affect generations in the distant future.

The Role of Discounting

The future benefits of any climate policy thus depend on the choice of discount rate. Economists have had a long and robust debate on the appropriate discount rate for long-term policy problems.[15] Some support a *prescriptive* approach on ethical terms, effectively arguing that all generations should be treated equally, with the permissible discounting to reflect changes in wealth and how the incremental value of consumption declines at higher levels of wealth. Others support a *descriptive* approach based on revealed preferences in markets in which rates of return on investment could guide the discounting of societal benefits and costs from climate policy intervention. Complicating the considerations under these very different schools of thought are the implications of uncertainty in determining the appropriate discount rate. As a result, an analyst can draw from a range of plausible discount rates in evaluating the economic impacts of climate policy. (For more on choosing a discount rate that accounts for the interests of future generations, see the article in this issue by Simon Dietz, Ben Groom and William Pizer.)

In choosing a discount rate, the stakes are large. Table 1 shows how the present value of $1,000 in climate damage occurring in 2050 varies by a factor of more than 30—from $19 to $623—depending on a choice among four different discount rates. Similarly, the present value of $1,000 in year 2100 damages ranges from 5 cents to $311, and the present value of $1,000 in year 2200 damages ranges from near zero to $77.

Table 1. Present Value of $1,000 in Climate Damages Occurring in 2050, 2100, and 2200 under Various Discount Rates

$1,000 in Damages Occurring in Year	Discount Rate 1.4%	2.5%	3.0%	5.0%
2050	$623	$269	$99	$19
2100	$311	$39	$3	$0.05
2200	$77	$0.82	$0.004	~$0

When former World Bank chief economist Nicholas Stern used a discount rate of 1.4 percent in his 2006 review of the economics of climate change for the government of the United Kingdom, the majority of the present value damages from climate change (that is, the benefits of mitigating climate change) reflected benefits enjoyed after the year 2200.[16] To characterize the benefits of mitigating greenhouse gas emissions, the US Interagency Working Group on Social Cost of Carbon produced estimates of the social cost of carbon—the dollar value of reduced climate change damages associated with reducing carbon dioxide emissions by 1 metric ton (1,000 kilograms, or about 1.1 US tons).[17] Those estimates have been used by federal regulatory agencies whose rulemaking affects carbon dioxide emissions, including the Environmental Protection Agency (EPA), the Department of Energy, and the Department of Transportation. The Interagency Working Group's two reports presented social-cost-of-carbon estimates for three discount rates: 2.5 percent, 3 percent, and 5 percent. The 2015 social cost of carbon at the 2.5 percent rate is $58 per metric ton of carbon dioxide, which is more than 50 percent greater than the social-cost-of-carbon estimate for that year based on a 3 percent discount rate and almost five times greater than the estimate at the 5 percent discount rate. Those results are not necessarily surprising: the National Research Council has said the social cost of carbon can plausibly vary by a factor of 100, with the choice of discount rate determining one-tenth of that variation.[18]

Because the social cost of carbon distills the impacts of climate change into a single measure of marginal damages associated with carbon dioxide emissions, that social cost can guide the design of welfare-maximizing public policies. Just as an investor in business capital pursues investment until the return on the last dollar of investment is equal to the return of the next-best alternative investment, a policy maker can pursue climate protection policy until the marginal cost of emission mitigation is on par with the societal return on that mitigation: the social cost of carbon. Thus, mitigation policies with marginal costs equal to the social cost of carbon—for example, a carbon tax in line with the social cost of carbon—would maximize net social benefits.

In practice, public policies appear to deviate significantly from the guidance that cost–benefit analysis could supply. With the exception of a few carbon tax programs in northern Europe and the Canadian province of British Columbia, most policies that affect greenhouse gas emissions do not explicitly set prices (or marginal costs) on emissions. Some governments—such as the European Union,

California, Quebec, and several cities in China—employ carbon dioxide cap-and-trade programs. (A cap-and-trade system constrains the aggregate emissions of regulated sources by creating a limited number of tradable emission allowances—whose sum is equal to the overall cap—and requiring that those sources surrender allowances to cover their emissions.[19]) The dramatic volatility in allowance prices in such markets, especially in the European Union Emissions Trading System, indicates that, in all likelihood, the marginal cost of compliance rarely equals the social cost of carbon.[20] Examination of policy instruments around the world suggests that explicit and implicit carbon prices under such policies vary by a factor of 100.[21]

The variation in carbon prices could reflect differences in how governments evaluate the benefits of their climate protection programs. Given the uncertainty in the social cost of carbon, it's possible that failure to coordinate on a single estimate of the benefits has resulted in policies that reflect the tremendous variation in marginal costs. It's more likely, however, that special interests have influenced the policy debates, which have yielded a vast array of *n*th-best public policies in lieu of a carbon tax. That influence can take several forms.

Engagement of Stakeholders

First, insurgent firms might push for public policies that subsidize and/or mandate their innovative technologies. They may have strong interest in policies that could, in the context of the broad capital framework presented previously, produce excess investment in their technologies. For example, some possible renewable power policies have implicit carbon prices 10 times greater than the US government's estimate of the social cost of carbon at a 2.5 percent discount rate.[22] Incumbent firms might not oppose such policies if they perceived that policy implementation would weaken political resolve for more-comprehensive and more-ambitious policies, such as a carbon tax.

Second, certain special interests might attempt to use public support for climate protection policies as a rationale for their preferred policies, even if those policies would have negligible impacts on the global climate. For example, biofuel producers have claimed that their output can substitute for carbon-intensive petroleum products. In practice, the vast majority of biofuels sold in the United States are corn ethanol blends, which, over their life cycles, yield very small carbon dioxide emission benefits compared with gasoline manufactured from crude oil.

Third, incumbents might support public policies that impose more-substantial regulatory requirements—and hence greater costs—on new sources of emissions.[23] Such so-called vintage-differentiated regulation has been used in many contexts, including vehicle pollution standards and power plant pollution regulations.[24] The incumbents may claim that it would be unfair to set strict standards on their existing assets because that would effectively change the rules of the game relative to when they made their initial investments in those assets. They also sometimes claim that it would be less expensive to impose requirements on new capital, as opposed to retrofitting existing capital. In effect, vintage-differentiated regulation can extend the lifetimes of existing, pollution-intensive capital because the cost of new capital is higher under the regulation. Imposing a single, common carbon price on emission sources would

eliminate the inefficiencies of vintage differentiation and establish a level playing field for both existing and new capital. But the prospect of a level playing field is exactly what spurs incumbents to push for the vintage differentiation approach.

The Baptists, who opposed Sunday liquor sales for moral reasons, and the bootleggers, who opposed Sunday liquor sales for business reasons, found common cause in policy debates.

Fourth, and most important, is what Bruce Yandle, former executive director of the Federal Trade Commission, calls the *bootleggers and Baptists* phenomenon.[25] The Baptists, who opposed Sunday liquor sales for moral reasons, and the bootleggers, who opposed Sunday liquor sales for business reasons, found common cause in many state and local policy debates. The key characteristics of such coalitions are that the moral champion sets the policy objective and the business champion determines the implementation. For example, in the climate policy context, environmental groups might call for ambitious emission mitigation goals, and some businesses might support them conditional on their being able to influence the policies designed to implement the goals. As a result, a simple economy-wide carbon tax could be rejected in favor of a much more complicated suite of policies that conveys returns to (at least some) incumbent firms, perhaps in a relatively opaque manner.

When Can Future and Current Generations' Interests Coincide?

We might be able to design climate change policies that can draw support from various special interests in the current generation, including (some) incumbents and insurgents. To provide background for those opportunities, I identify insights from other policy contexts and point out important differences between those contexts and climate change.

Other Policy Contexts: Insights and Differences

A successful climate change policy will transform the energy foundation of industrial economies. That transformation will require a long-term, comprehensive commitment in the United States and in economies worldwide. As we've seen, the political challenge reflects the near-term costs, borne by one group, coupled with the long-term benefits, enjoyed by other groups. In that regard, climate change differs from other major policy reforms in American history. Let's consider a few examples.

The innovation of public pensions through the 1935 Social Security Act provided almost immediate economic benefits for then current retirees as well as the promise of retirement benefits for all workers once they attain retirement age. Through a payroll tax, all workers bear the costs of participating in Social Security, but on retirement, those workers all enjoy the returns of having done so. Moreover, creating an age-specific program gave older populations strong incentive to mobilize politically to sustain the public pension program. Older people can lobby and have lobbied for similar programs throughout the developed world as

a result of successful special interest political competition.[26]

The Interstate Highway Act of 1956 called for a 40,000-mile network of high-speed freeways across the United States, which in turn created substantial numbers of construction jobs in every state and congressional district, delivering broad near-term economic benefits. In addition, the Interstate Highway System fulfilled important needs in terms of homeland defense and the military threat posed by the Soviet Union. That infrastructure investment led to rapid growth in the transportation of goods and people during the following decades. Moreover, the freeways were financed through gasoline and diesel taxes—which are effectively user fees—so that many of those enjoying the benefits also bore much of the costs.

The Clean Air Act Amendments of 1970 and the Clean Water Act of 1972 established ambitious standards, new regulatory authorities, and extensive enforcement tools to clean up the nation's poor air and water quality. Media images of a river catching fire and of cars driving with headlights on during the middle of a cloud-free but highly polluted day illustrated the environmental crisis that motivated a broad political response through those laws. Americans' everyday experience with poor air and/or poor water quality dramatically increased the importance of the problems and drew attention to the need for policy remedies. In contrast to climate change policy, which is intended to prevent a future environmental crisis, those laws aimed to correct existing environmental degradation and, in some places, a current environmental crisis.

Those three examples—of social insurance, infrastructure investment, and environmental policy—pinpoint some of the major characteristics of long-term, durable, and successful public policies. First, each one remedied a publicly salient contemporary crisis or threat. Second, each one shows how near-term benefits can be enjoyed broadly across the country. Third, in the case of Social Security and the Interstate Highway System, there were few private sector incumbents that could be adversely affected by the public policies. The absence of private old-age insurance and private freeways served as the motivation for those public interventions.

The case of climate change differs in all three aspects. First, when it comes to climate change, the task today is to prevent rather than remediate. Second, most of the benefits of climate policy will accrue in the coming decades and even centuries. Third, climate change policy could easily reduce the value of an extensive array of fossil fuel capital and resource stocks.

Implications for Climate Change Policy

Climate change differs in another important way from those three public policy examples. Old-age pensions, freeway construction, and local air and water quality are distinctly domestic challenges, but climate change is a global problem that will require multilateral coordination. Although in this article I've focused on the US political economy, the same issues play out in other countries and shape the conduct of climate-related international relations. The question of who bears the cost of climate change mitigation has served as one of the primary factors limiting the progress of multilateral climate negotiations.[27] The prospect that the United

States could impose costly, unilateral emission mitigation policies while its trade partners fail to implement climate change policy has caused US manufacturers to worry about losing competitiveness, even if the empirical evidence suggests quite modest impacts.[28] Moreover, many developing countries claim that their current economic development needs—including education and public health benefits for today's children—trump the need for them to invest in climate mitigation. Some developing countries have indicated they would undertake substantial emission mitigation only once they have raised the wellbeing of their populations to satisfactory levels.

Despite the differences, though, insights gained from successful policies in other domains could help meet the political economy challenge of climate change policy. For example, designing climate policy to deliver broad, near-term benefits could help overcome some of the political opposition. To achieve that might require linking climate policy with other policy issues or linking various interest groups. Prominent events such as Hurricane Sandy and heat waves might also be cited to focus public interest on tackling the climate change problem. And if climate policy can pass Congress, then Congress's inertia may create an institutional bias for sustaining climate policy.

Given those insights, let's consider a few examples of how policy could alter the difficult political economy of climate change and produce meaningful action.

Policy Choice and Design

The political need for near-term benefits, coupled with the bootleggers-and-Baptists phenomenon, suggests that climate policy could be tailored to compensate owners of capital who might bear the costs of protecting the climate. For example, a greenhouse gas emission cap-and-trade program could be designed in a way that secures support from a broad array of the owners of private capital. Faced with the choice of surrendering an allowance or reducing emissions, companies would place a value on an allowance that reflects an emission-reduction cost they could avoid by surrendering an allowance. Regardless of how the allowances are distributed initially, trading can ensure that allowances are put to their highest-valued uses: covering the emissions that are most costly to reduce and providing an incentive to undertake the least costly reductions.[29]

By setting a binding cap on emissions and establishing tradable emission allowances, the government would effectively create an asset with substantial value. Various analyses that model proposed economy-wide cap-and-trade programs for the United States suggest that the value of allowances could range from $100 billion to $300 billion annually.[30] At least in the early years of a cap-and-trade program, that value would likely exceed the direct costs borne by owners of capital in complying with the program. One analysis showed that giving about 15 percent of emission allowances to US fossil fuel producers would leave their profits unchanged under a cap-and-trade program.[31] Moreover, strategic allocation of allowances could elicit support from industry for a cap-and-trade regime.[32] The American Clean Energy and Security Act of 2009 (H.R. 2454), also known as the Waxman–Markey bill, which passed the US House of Representatives, received the support of the US Climate Action Partnership, a coalition of businesses and environmental organizations that includes about 20 major corporations in the energy, manufacturing, and services sectors. The bill gave away

About Waxman–Markey

The American Clean Energy and Security Act of 2009 (H.R. 2454), also known as the Waxman–Markey bill, introduced in March 2009, called for an economy-wide cap-and-trade program for greenhouse gas emissions. The program would have established binding emission caps that would have lowered US greenhouse gas emissions to 17 percent below 2005 levels by 2020, with further reductions each year until reaching 83 percent below 2005 levels by 2050. Though the bill passed the House of Representatives in June 2009, and a modified version—the Kerry–Boxer bill—passed the Senate Environment and Public Works Committee in November 2009, the bill did not receive a floor vote in the Senate and thus failed to become law.

allowances at no cost to a vast array of users, slowly transitioning to an auction system over several decades.

By modifying implementation to secure political support from incumbents, such an approach might risk forgoing socially valuable investment that future generations would prefer. For example, channeling some of the value of emission allowances to finance research and development could significantly lower the long-term costs of emissions mitigation and yield returns to other sectors of the economy. Revenues from climate policy could also be used to reduce the burden of existing taxes (more on that later).

Strategically Linking Interest Groups

I've shown that tailoring climate policy to deliver direct economic value to incumbent firms could compensate them for the costs of such policies and thus reduce or eliminate their opposition. An alternative approach could take the value created under climate policy and dedicate it to tax reform.[33] The government could set either a tax in terms of dollars per ton of carbon dioxide emissions from sources covered by the tax or—more likely—a tax on the carbon content of the three fossil fuels (coal, petroleum, and natural gas) as they enter the economy. The revenues raised by the carbon tax (or, similarly, by an auction of emission allowances under a cap-and-trade program) could be used to elicit strong support from a broader business constituency. Writing elsewhere, I've proposed using carbon tax revenues as part of a larger reform of the tax code coupled with eliminating greenhouse gas regulation under the Clean Air Act.[34] Business stakeholders interested in corporate tax reform and lowering the marginal tax rate on corporate income could find that proposal appealing.

A potential drawback to this approach is that it would distribute the benefits of tax reform to a much broader group of business interests than only those directly affected by climate policy. Companies may not support direct subsidies if they can't effectively limit who receives the subsidies, as in the case of an across-the-board cut in the corporate income tax rate.[35]

Carbon taxes also face a great deal of resistance. Despite economists' enthusiasm for such taxes, the general public and the American political system have been less receptive. A carbon tax makes the cost of environmental policy much more obvious than conventional regulatory approaches do, which could in turn impose political costs on politicians seeking reelection. Moreover, a tax imposes costs on concentrated, influential, and resourceful business interests, such as oil, gas, and coal companies. Finally, few environmental groups have embraced a carbon tax because they worry that it would

be less effective in reducing emissions than conventional regulations would.

In contrast, a carbon tax has received support in other countries. Scandinavian governments, as well as the government of the province of British Columbia, have implemented such a tax. Differences in political institutions, in public attitudes toward the environment, and in the emission intensity of the resource base (for example, about 90 percent of British Columbia's power comes from hydroelectric dams) help explain the greater support for a carbon tax in those economies than in the United States. Nonetheless, the majority of the world's population lives in developing countries that subsidize the consumption of fossil fuel–based transportation, fuels, and electricity.[36] The difficulty of reforming fossil fuel subsidies reflects political obstacles similar to the pricing of carbon through a carbon tax. The global trend, however, is toward greater interest in and support of policies that price carbon.[37] Because the emerging international climate policy regime focuses on countries' making unilateral emission mitigation pledges subject to periodic review, such domestic policy reforms could become the foundation for international coordination to protect the global climate. Indeed, the structure of international climate policy reflects, in large part, domestic political constraints in the major economies participating in the climate negotiations.

Alternatively, policy designers could aim to draw support from across multiple generations. Public opinion polls tend to show that younger people have stronger interest than older people do in addressing climate change, and older people have stronger interest in supporting Social Security and Medicare. Climate policies that integrate those interests could attract a broad political constituency across generations.[38] For example, the tax or auction revenues from climate policy could fill funding gaps in other government programs, such as Social Security or Medicare. In 1997, staff of the Council of Economic Advisers analyzed how revenues from a carbon dioxide cap-and-trade program could offset forecast funding shortfalls in Social Security.

Strategically Linking Issues

The marketing of climate policy could focus on ancillary benefits enjoyed by the current generation. Politicians advocating for climate change mitigation policies often note that improved local air quality also improves respiratory health and reduces the risk of death.[39] For example, in his 2013 Georgetown University speech, President Obama said, "So today, for the sake of our children, and the health and safety of all Americans, I'm directing the Environmental Protection Agency to put an end to the limitless dumping of carbon pollution from our power plants, and complete new pollution standards for both new and existing power plants." In August 2015, through the so-called Clean Power Plan, the US Environmental Protection Agency issued the standards Obama called for in that speech. In its economic evaluation of the regulation, the EPA estimated year-2030 climate benefits of $20 billion and public health benefits ranging from $14 billion to $30 billion from reducing local air pollutants.[40]

Yet the argument that climate policy could also improve health faces political and policy obstacles. Some opponents of climate policy agree on the value of improving local air quality but question whether greenhouse gas mitigation policies represent the most

effective way to deliver those benefits. For example, they might argue that if reducing fine particulate pollution yields major health benefits, then environmental policy should target particulates directly. A report by the Organisation for Economic Co-operation and Development found that the local air quality cobenefit of mitigating carbon dioxide emissions may not motivate large developing countries to implement ambitious climate change policies, because directly controlling air pollution appears to be less costly in those countries.[41] Moreover, many policies that directly target conventional air pollutants do not necessarily reduce—and in some cases may increase—carbon dioxide emissions. Installing scrubbers on coal-fired power plants, for example, imposes an energy penalty that effectively increases the emissions of carbon dioxide per kilowatt-hour of power generated.

In the 2009 debate over the Waxman–Markey bill, politicians often described it as a "jobs bill" that would promote US energy independence. For example, at the end of the floor debate on the bill, Speaker Nancy Pelosi's entire speech was "Jobs, jobs, jobs, jobs." On the other side of the debate, opponents decried the bill as part of a broader pattern of "job-killing regulations." In practice, neither of those rhetorical positions is on target. Pricing carbon is unlikely to serve as a credible substitute for economic stimulus, and empirical analyses suggest that the potential for job losses in energy-intensive manufacturing—the sectors most likely at risk under climate change policy—is quite modest and is swamped by other factors affecting the same labor markets, such as technological innovation and trade policy.[42] Nonetheless, advocates for US climate policy continue to point to the job creation opportunities associated with insurgent technologies.

Making Insurgents into Incumbents

Subsidizing energy efficiency and renewable energy can, over time, increase the size and the potential clout of the insurgent-business constituency. For example, the US solar industry recently claimed that it employs more workers than the US coal industry. The growth of the solar industry reflects a variety of market and policy factors, including very generous support for solar power through the American Recovery and Reinvestment Act of 2009. Several new utility-scale solar facilities have been supported through government-subsidized loan guarantees. All solar investment benefits from accelerated depreciation and a capital subsidy in the form of a grant or an investment tax credit. Those policies have also significantly contributed to the growth of the US wind power industry, which has more than doubled its installed capacity since 2008.[43]

Owners of capital with large investment positions in novel energy technologies have a vested interest in policies that create markets for those innovations.

Likewise, the ramping up of clean energy investment, especially in Silicon Valley, south of San Francisco, has helped promote support for climate protection policies. Owners of capital with large investment positions in novel energy technologies have a vested interest in policies that create markets for those innovations. As a result, during the

public debate about the future of California climate policy around the 2010 ballot proposition 23—which would have effectively ended California's efforts to design and implement climate change policies, including a cap-and-trade program—incumbent big oil companies made substantial donations to support the proposition, and major investors in clean energy ventures made substantial donations to oppose it. The proposition's opponents raised almost three times as much in donations as the proponents did, reflecting the political and economic strength of clean energy capital in California.

Finally, investing in research and development for new technologies can change the economic calculus for future policies. Encouragement of innovation can deliver new knowledge, new technologies, new processes, and new products whose existence is irreversible. A major R&D program today could lower the costs of mitigation policies tomorrow by increasing the range of commercial low- and zero-carbon technologies. Indeed, the August 2015 EPA Clean Power Plan set more-ambitious carbon dioxide targets for the US power sector than the EPA had proposed earlier—partly because the costs of new renewable power-generating technologies had fallen.[44] Those declining costs reflect a number of things, including a multidecade history of public sector support for renewable energy R&D and subsidies that have contributed to scale economies and learning by doing.

Institutions and Durable Climate Policy

In their scholarship on environmental policy, economists have sometimes assumed away the importance of institutions.[45] Nonetheless, the political institutions through which climate policy is made can significantly affect the influence of various constituencies and the outcome of policy debates. In particular, the design and implementation of policy-making institutions can create veto points and opportunities for people engaged in climate policy debates.

Let's consider a few illustrations from the process of drafting new statutes in Congress and writing rules in regulatory agencies before examining how to design a durable climate policy by exploiting existing institutional frameworks. In Congress, committees play the initial roles in writing, rewriting, and voting on bills. The composition of committee memberships is not random but reflects the interests of specific members as well as the interests of their constituents and campaign backers. For example, the composition of the House Energy and Commerce Committee affected the design and revision of the 2009 Waxman–Markey bill as well as the committee's voting.[46] In particular, the disproportionate representation of energy-producing districts affected the way allowances were allocated; for example, a set-aside of free allowances for petroleum refineries was necessary to secure the votes of several members with refineries in their home districts.

Various stakeholders' political influence with members of specific committees can affect the types of policies those stakeholders support. Some stakeholders have developed strong relationships with committees whose jurisdiction constrains the kinds of policies they write into bills. For example, the preference for cap and trade in US climate policy debates—at least relative to a carbon tax—may reflect environmental advocates' preference for working with environmental committees (such as the Senate Environment and Public Works Committee and the House

Energy and Commerce Committee) than with tax-writing committees, which they view as less green and controlled by incumbent business interests.[47]

The voting rules in Congress—particularly in the Senate, with its de facto supermajority vote requirement under today's filibuster procedures—also influence the characteristics of policy. For example, two colleagues and I simulated support for a national clean energy standard in the House and Senate and contrasted it to what would be expected under a national referendum (that is, majority rule) based on survey data.[48] The 60-vote threshold to defeat a filibuster in the Senate suggests that only a very low-cost, modest clean energy standard would pass that chamber—in contrast to what would be possible under simple majority-rule voting in the Senate. Given young voters' greater support for policies to reduce greenhouse gas emissions relative to that of older voters, voter turnout among younger generations could change the composition of Congress and make it more inclined to consider climate change legislation.[49] Of course, other factors could constrain that influence, such as the construction of congressional districts; the extent to which any voters, young or old, vote based primarily on a candidate's position on climate change; and the campaign finance landscape.

Alternatively, the executive branch could use its statutory authority to draft new regulations on climate policy the way the EPA did with the Clean Power Plan.[50] That regulation illustrates the many institutions involved in climate policy—and the many opportunities for delaying or vetoing it. First, the EPA proposed the rule and solicited comment in 2014. It received more than 4 million public comments, and that feedback shaped the final rule. Second, the EPA's final rule, issued in August 2015, gave Congress the opportunity to strike down the regulation under the Congressional Review Act. Third, several coal companies opposing the rule filed lawsuits on the same day that the EPA issued the final rule, and legal scholars anticipate an important and potentially lengthy judicial review process. Finally, the Clean Power Plan includes a very important role for the states in developing their own plans for reducing power-sector carbon dioxide emissions. That reflects the nature of federalism in general in American public policy and particularly for climate policy (under the Clean Air Act, the statutory authority for this regulation), which can influence incentives and create opportunities for policy innovation as well as establish another veto point for opponents of climate policy.[51]

Building a durable, long-term climate policy will require accounting for and exploiting existing political institutions.[52] The veto points raise barriers to realizing meaningful climate policy in the first place. For example, the failure to pass national cap-and-trade legislation in the Senate in 2010 precipitated the development of the regulatory approach by way of the 2015 Clean Power Plan. Of course, the veto points built into American political institutions can also serve to maintain climate policy should it become the new status quo. Securing a long-lived political constituency for a climate policy would help it last. Given the strong bias for the status quo in American political institutions, this would mean, first, bringing together a sufficiently strong political coalition to change policy from the status quo and then maintaining that coalition to defend the new status quo once climate policy has taken effect. The design of climate policy, including the design and

implementation of new institutions and the use of existing institutions, could facilitate such a defense. Incorporating flexibility—to permit modifications of policy as new information arrives—may also ensure strong political support and policy durability, so long as we don't introduce new veto points into the process.

Conclusions

Mark Twain allegedly said, "Everybody talks about the weather, but nobody does anything about it." The risks posed by climate change have for decades elicited political rhetoric but little substantial policy action. That political outcome is not surprising given that the benefits of climate policy disproportionately accrue to future generations and that the costs are disproportionately borne by current generations—and concentrated among select incumbent firms in the fossil fuel industries.

I've used a stylized capital framework to illustrate both how to frame the current generation's obligations to future generations and the political economy challenges of mobilizing action to address climate change. Owners of existing business capital—especially the large incumbent firms—have strong incentives to oppose climate policy. Their private interests diverge from the larger societal interests to maximize the return to all forms of capital, including natural capital. Ensuring that today's children as well as their children and their children's children will grow up to enjoy a level of wellbeing and consumption no worse than what today's generation experiences requires a public policy response that promotes a broad approach to investment in all forms of capital.

Today's children, as well as future generations, lack a voice in climate policy debates. But we can design policy approaches that attempt to drive action consistent with their interests. The key challenge lies in crafting policies that mesh the interests of the current generation with those of future generations. I've presented several such approaches, drawing from both economic research and real-world policy debates. Indeed, incumbent firms' preference for policies that maximize private returns can be used to design climate policies that deliver some near-term benefits in exchange for meaningful climate change mitigation. Alternatively, a successful climate policy design could link issues or link interest groups in a way that builds support in a policy space broader than just climate change. Finally, policy support of insurgent firms with low-carbon, disruptive technologies could eventually transform those organizations into politically potent incumbents that could challenge the fossil fuel firms. Tailoring climate policy to mollify the incumbents that oppose it and to boost the potential of the insurgents to build broad political support will be necessary if we are to mobilize successful political action to combat climate change.

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