

Political Ideology and the Green-Energy Transition in the United States

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Abstract

A conceptual framework is developed with the goal of explaining the political dimensions of the green-energy transition by taking into account relations among the scientific, industrial, and political fields. The framework includes the concept of the ideological field, which is used to analyze the political processes involved in defending and attacking green-transition policies. After outlining the conceptual framework, the chapter applies it to the green-energy transition in the U.S. by discussing the political and ideological associations with different types of green technology; the backlash against green-transition policies, including climate science denialism; and differences among states and between the state and federal governments. The research shows the important role of developmentalist ideology in response to neoliberal ideology, the factors that influence the variegated pattern of the green transition at the state government level, and the role of countervailing industrial power in weakening the capacity of the fossil-fuel industry to block the transition.

The problem of environmental limits is one of the most important political challenges facing modern societies, because failure to address the limits could lead to catastrophic disasters. The most pressing environmental limit is anthropogenic greenhouse gases, but there are many others, including the destruction of habitats, loss of freshwater resources, and persistent chemical pollutants in the environment. Because markets do not adequately internalize long-term environmental costs, it is necessary for public policy to guide the redesign of large technological systems (LTSs)—such as electricity, transportation, and food production—so that they are more sustainable. However, the definition of the goal, the design of systems that are in some sense more sustainable, and the optimal pace of reform are highly contested politically. Thus, the study of the transitions of LTSs requires an approach that can interpret and understand the political processes involved. This chapter will outline the approach that I have been developing for the study of the sustainability transition, apply it to the case of the politics of the green-energy transition in the U.S. during the Obama administration, and discuss some general implications for theory development in STS. The implications will include the need to include issues of scale and geographical unevenness in the framework for the study of sustainability transitions.

Conceptual Background

Contemporary STS research on technological change can be divided into two main traditions. Constructivist accounts, such as the social construction of technology and actor-network theory, draw attention to the role of actors in negotiating changes in sociotechnical systems (e.g. Bijker et al. 1987). From this body of work a set of influential and useful concepts has emerged for the study of technological change, including interpretive flexibility, social negotiation, enrollment, obligatory points of passage, and closure or stabilization. The second

main approach, the study of large technological systems (LTSs), emphasizes the development and transition of those systems, the imbrications of social and material processes, and the factors that affect system change and stasis (Geels 2005, Grin et al. 2010, Hughes 1983).

The approach adopted here builds on and extends both the agency-based and transition frameworks by beginning with field theory and drawing attention especially to the role of political ideology in technological change. Social fields are networks of actors (both individuals and organizations) who share a common definition of what is at stake but have different viewpoints about what the outcomes of action in the field should be (Bourdieu 2005, Fligstein and McAdam 2012). Actors engage in relations of cooperation and conflict to achieve dominance for a particular vision of what the field should be and who should dominate it. For the study of technological change, the most relevant social fields are the political field (characterized by conflicts over the control of legislatures and government administrations in order to influence policy outcomes), the scientific field (conflicts over priorities or agendas in a research field that affects technological innovation and evaluation), and the industrial field (conflicts over market position and the dominance of one type of design or product over another; see also our discussion in Moore et al. 2011). These fields are cross-cut by differentials of power and actors associated with more and less privileged groups both within fields and across fields; thus, conflicts of class, race, gender, and inequality are essential for analyzing fields. Furthermore, the fields themselves can be analyzed at variable scale from the microsocial to the global.

Whereas functionalist approaches to the similar meso-sociological concept of institutions emphasized unity and coherence under relatively stabilized systems of norms and rewards (Merton 1973), field analysis draws attention to relations of cooperation and conflict, the importance of strategies, and power in the sense of the differential capacity to influence outcomes. Although it is possible for completely egalitarian fields to exist, in general social fields tend to be characterized by at least some agents in relatively subordinate positions, and they sometimes see themselves as challengers to “incumbents” in dominant positions. For example, in the scientific field there are conflicts between the dominant networks with their mainstream research programs and challengers who often occupy less powerful institutional positions (e.g., Brown 2007, Frickel and Gross 2005). Challengers may also be aligned across social fields; for example, some scientists, often in subordinate positions in their own research fields, may form alliances with social movements that have identified “undone science,” or systematically underfunded areas of research that may be of broad potential benefit (Frickel et al. 2010, Hess 2011).

One of the weaknesses of current formulations of field theory is that the concept of culture tends to be restricted to concepts such as “habitus” and “social skill.” The Geertzian approach to culture as models of and for action is more open, but Geertz, like Merton for the study of institutions, emphasized the coherence and integration of cultural systems rather than their contested aspects (Geertz 1973). Thus, one needs a method that emphasizes culture as only partially shared, sometimes unconscious, and sometimes contested. When applying this approach to the political field, I have focused on tensions among political ideologies, just as in the scientific field one might study tensions among research programs or paradigms. This approach is similar to one emerging in the sociology of science and organizations that examines the role of competing institutional logics (e.g., Berman 2012). However, I view the logics themselves as organized in a systematic way, that is, defined by mutual opposition in a cultural field of contrasting logics. In the political field these logics appear as an “ideological field,” a dimension of the political field that involves contestation over the underlying systems of legitimate political principles that shape and are shaped by political discourse and policy. We might think of the ideologies as cultural systems, but reanchored in a field sociology that eschews the integrationist assumptions of Geertzian culturalism and Parsonian functionalism.

In the United States and most other industrialized Western countries, the central ideological conflict in the political field is between some variant of social liberalism (often called

“social democracy” in Europe) and an opposing configuration of neoliberalism. The former is associated with the view that the government should exercise a relatively strong redistributive and regulatory function with respect to the market and that relatively high levels of government intervention in the industrial field are justified in order to serve collective goals such as health, environmental protection, and social fairness. In its strongest forms, social liberalism forms a continuum with socialism, which advocates increased government ownership of crucial industrial sectors such as health care, energy, communication, and transit. In contrast, neoliberal ideology articulates the position that markets should be enabled wherever possible, that they should replace policy when possible, that their regulation should be minimized, and that nonprofit and for-profit organizations are the best sites for solving the social problems associated with redistribution. In its strong form the view involves market fundamentalism, which advocates widespread deregulation, dismantling of welfare-state protections, and privatization of public assets.

In studies of the green-energy transition in the U.S., I have shown that a second ideological tension has also played an important role in policy disputes (Hess 2012a). Developmentalism involves support for government intervention in the economy in order to nurture and protect local or domestic industries in the face of global competition. In the nineteenth century, the U.S. used protectionist and industrial policies to build up its industrial base and to protect it from European competition, and in the twentieth century such policies were common in the newly industrializing countries that practiced import-substituting industrialization. Developmentalist policies and ideology also continued in the U.S. throughout the twentieth century at the state government level in economic development policies and programs. Just as there is a tension between neoliberalism and social liberalism, so developmentalism is sometimes challenged by a less influential form, localism, which focuses on the development of the locally owned small-business sector, often through an import-substitution rhetoric and strategy.

Before using the concept of ideology in the study of the politics of LTS design and transitions, two qualifications are necessary. Ideologies are ideal types. Sometimes specific statements by political actors and specific policies approximate those ideal types, but politics is the art of compromise, and consequently ideologies often appear as compromise formations, in which elements of disparate ideologies are overlaid and syncretized. Furthermore, the explicit debates over political ideology and the changes in policies, organizational routines, and everyday practices that coincide with those debates interact with deeper transformations of cultural logics and identity (Rose et al. 2006). For example, the debates over social liberalism and neoliberalism contribute to a doxa of a diffuse cultural logic of responsibility, with differences between a social sense of responsibility and an alternative, enterprising sense. Likewise, the tensions in economic development ideologies create a doxa of place-based identity, with tensions between a protective and globalist sense. This point will not be developed here, but it is important to flag it in order to avoid misunderstandings about the relationship between ideologies, which are relatively explicit and self-conscious systems of meaning, and the more implicit cultural logics that become embedded in a wide range of practices across diverse social fields.

The remainder of the essay will show how these concepts apply to the politics of the green-energy transition in the United States. Consistent with the goals and format of this volume, the analysis will include a discussion about the relationship between institutionalization and disruption of technology transitions, political values and material culture, and scalar and spatial dynamics of the politics governing the transitions.

Disruptions

In the environmental policy field in the U.S., as has occurred in many other policy fields in many countries, there was a long-term transition from command-and-control regulation to a

second generation of policies that relied more on market mechanisms (Mazmanian and Kraft 1999). In turn, these changes were part of the broader neoliberalization of the political field that began during the 1970s and at first involved regulatory roll-back (Harvey 2005, Peck 2010). By the 1990s, growing scientific knowledge about the effects of greenhouse gases on global warming led to increasing calls for policy reforms from environmentalists and allied political leaders, but these policies were in conflict with both the interests of the fossil-fuel industry and with neoliberal ideology, because a response to climate change required extensive government regulation of industrial processes (Klein 2011). The Byrd-Hagel Resolution of the U.S. Senate, which passed with a 95-0 vote, blocked the ratification of the Kyoto Protocol. The text of the resolution also voiced the view that restrictions on greenhouse gases would harm the country's economic viability and that developing countries should also join such agreements. In terms of underlying ideologies, the resolution combined the neoliberal view that environmental regulation was potentially harmful to markets with the developmentalist view that the U.S. should defend itself against treaties that would be prejudicial to domestic industries (U.S. Senate 1997). This view was embraced by the Republican president George W. Bush (2000-2008), who opposed all major initiatives toward a green-energy transition.

The election of President Obama in 2008 disrupted the stasis in the federal government's environmental policy field, because his promise to create five million green jobs was a central goal in the first years of his administration. The frank acknowledgement of climate change and its linkage to job creation and business development was a substantial change from the previous administration. In the 2008 election, the president drew on support from a diverse coalition that included the Blue-Green Alliance of labor and environmental organizations, which provided some financial support and on-the-ground voter turn-out for Democratic Party candidates. Although portions of the green jobs policies were consistent with social liberalism (such as the programs that supported weatherization of low-income households and job creation for relatively unskilled workers), Obama's rhetoric and programs drew on developmentalist ideology to frame green-energy policies as instruments of energy independent, job creation, domestic manufacturing revival, and business development. Thus, environmental reform was linked to the economic crisis and the goal of job creation through green industrial development. The first legislative victory associated with the transition, the American Recovery and Reinvestment Act of 2009, included support for a wide range of green technologies and green jobs programs, but the administration also adjusted annual budgets in favor of renewable energy and energy efficiency. In 2009 the House of Representatives passed the American Clean Energy and Security Act (HR 2454), a sweeping law that would have created potentially millions of green jobs by bringing a cap-and-trade system of emissions regulation to the country, a national renewable portfolio standard for electricity (20 percent by 2020), and a national energy-efficiency standard.

However, by 2010 the disruption was itself disrupted. Political conservatives joined with wealthy donors associated with the fossil-fuel industry to mount a successful campaign in the U.S. Senate to block the corresponding bill, the Clean Energy Jobs and America Power Act (S. 1733). Senator John Kerry framed the bill not in social liberal terms as an environmental initiative but instead in defensive developmentalist language as "a bill for billions of dollars to create the next generation of jobs, and a bill to end America's addiction to foreign oil" (Lieberman 2010). Although lobbyists for the renewable energy industries and advocates from the Blue-Green alliance worked to support the legislation, they had significantly lower spending capacity than the fossil-fuel industry (Open Secrets 2013). Spending by wealthy donors associated with the fossil-fuel industry also had an effect on the mid-term elections of 2010. Of the 100 newly elected members of Congress in 2010, 94 made some kind of anti-green pledge, such as signing the "No Climate Tax Pledge" of the fossil-fuel funded organization Americans for Prosperity (Johnson 2010).

Many of the newly elected members of Congress and some of the existing members also endorsed skepticism and denialism of climate science, a position that was especially prominent in the Tea Party movement within the Republican Party. An opinion poll of self-identified Democrats, Republicans, independents, and Tea Party advocates showed that the first three groups believed that global warming was happening and supported at least a modest renewable portfolio standard law and global cap-and-trade treaties, whereas Tea Party supporters held the opposite views and even opposed the federal government mandate to shift to fluorescent light bulbs (Leiserowitz et al. 2011). Originally promoted by fossil-fuel companies, the denialist movement had spread to include conservative news media and conservative foundations and think tanks (Goldenberg 2012, Jacques et al. 2008). Once elected, anti-green Republicans held hearings on climate science and invited climate deniers to testify. In October, 2011, the House Science, Space, and Technology committee issued a strategy letter that targeted climate science funding across a wide range of government agencies, from the Department of Energy to the National Aeronautics and Space Administration and the National Oceanic and Atmospheric Administration, and the National Science Foundation (Climate Science Watch 2011; U.S. House of Representatives 2011). Although the Senate, which was controlled by the Democratic Party, blocked many of the proposed budget cuts, the attack on climate science funding had a chilling effect on federal government agencies.

The situation of a disrupted green-energy transition in the U.S. contrasts with that of some countries in Europe and even Asia, where fossil-fuel firms have a weaker position with respect to governments, and the industry in those countries has tended to engage in an energy diversification strategy and accept government initiatives toward a green-energy transition. In the U.S., there is an interfield configuration that facilitates industrial influence on the political field in general and enables a network of wealthy donors associated with the fossil-fuel industry to neutralize green-transition policies. The configuration has affected the field relationship between science and the state, which in the energy-environment policy field is altered from the traditional pattern found in other advanced, industrialized countries and even in many other policy fields in the U.S. Although the dominant networks of the scientific field (indeed, almost all researchers in the field with any symbolic capital) agree that greenhouse gases represent a significant threat to the stability of the global climate and that action is needed, their capacity to affect the policy process is blocked (Hess 2014). The traditional understanding of the expertise-policy process is no longer a helpful guide, because the capacity for scientists to present their knowledge as apolitical and neutral with respect to the political field's ideologies is lost. The science of global warming becomes equated with social liberalism, the road to serfdom, and European-style strangulation of the economy through statist dirigism.

After the electoral defeat of the Democrats in 2010 and the purging of many moderate (and often pro-environment) Republicans during the same election, the president backed away from the five-million green jobs frame and, to a large degree, from any new green-energy initiatives in the Congress (Roberts and Kincaid 2012). The 2012 election revealed a slate of Republican presidential contenders who were either outright climate-science deniers or opposed to the need for climate mitigation policies. However, the president also remained mostly silent on the issue and embraced an "all of the above" strategy on energy policy. As a result of the lack of support for green industrial policy in the U.S., the level of investment in green technology is lower than that of other G-20 countries on a per capita basis. In absolute figures China's government investment in clean tech surpassed that of the U.S. in 2009, and according to an analysis by Pew Charitable Trusts, Asian countries were poised to become global leaders in clean technology by 2040 (PEW Charitable Trusts 2010a, 2010b). American companies are dominant in the software-intensive smart-grid industry, but during the 2000s they had lost position in several areas of manufacturing, such as solar photovoltaics and batteries.

With policy initiatives blocked in Congress, the president shifted to administrative measures, such as voluntary fuel-efficiency constraints with the automotive industry, green-

energy goals for the military, and the regulation of carbon-dioxide under existing pollution laws. In response to the Obama administration's policy of greening the government and the military, by the summer of 2012 Republicans were also attacking the military's green energy policy (Abramson 2012). Although Democrats retained control of the White House and Senate in the 2012 election, the political opportunity structure for green-transition policies at the federal government level remained closed except for administrative measures.

Technological Differences and Political Positions

The previous discussion presents a first-level narrative of the politics of the green-energy transition in the U.S.: it became caught up in partisan disputes that had a left-right polarity associated with neoliberal and social liberal positions. To overcome the opposition, Democrats adopted strategies that drew on developmentalist ideology, repackaged social liberal regulations through market-oriented policy instruments such as cap-and-trade policy, and developed political coalitions in favor of specific types of green technologies.

The process of building and maintaining support for green-transition policies resulted in the disaggregation of the broad category of "green-energy technology" and the overlap of connotations of political ideology with subcategories of green technology. For example, the weatherization programs and "green collar" jobs that Democrats advocated were addressed to the needs of low-income, urban constituencies, because the programs created jobs and brought about savings on home heating and air conditioning costs, and the programs sometimes involved unions such as Laborers International Union of America. This element of the Obama administration programs was closest to the ideal of a "green New Deal" that some members of the labor-environmentalist coalition envisioned in 2009. Other programs, such as high-speed rail and support for wind farms, were both green-energy and steel-industry demand policies. Those policies were popular with unions associated with manufacturing, including the United Steelworkers Union, which played a leading role in the Blue-Green Alliance (Hess 2012a)

Unions also endorsed developmentalist policies especially for trade issues. They drew attention to the loss of manufacturing jobs and the need for a more defensive posture with respect to the aggressive developmentalism of trading partners, especially China (see Chen, this volume). One response from the administration was the "Buy American" program of the American Reinvestment and Recovery Act, and another was the administration's decision to investigate a trade complaint launched by the United Steelworkers union, which claimed that China had manipulated trade agreements and significantly damaged green manufacturing in the U.S. (United Steelworkers 2010). In 2012 the administration responded to additional complaints from the solar and wind industries by initiating tariffs of up to 250% on imported photovoltaic panels and similar tariffs on wind turbine towers (Cardwell 2012, International Trade Commission 2012). By developing domestic procurement goals and adopting a more aggressive stance toward trading partners, the administration was able to shift developmentalist rhetoric to the side of green-transition policies (unlike its position in the Kyoto Protocol debate, when developmentalism worked against such policies). Although the administration utilized developmentalist ideology rather than social liberal rationales, the shift was still opposed on neoliberal grounds. For example, Republican Congressman Fred Upton used the bankruptcy of Solyndra, a solar manufacturing firm that had been supported with a government loan guarantee, to "question whether the government is qualified to act as a venture capitalist, picking winners and losers in speculative ventures and shelling out billions of taxpayer dollars to keep them afloat" (Wald and Savage 2011). The president responded by vowing not to surrender the U.S. solar industry to China (Condon 2011).

In summary, a defensive developmentalist ideology served to parry ongoing attacks on green industrial policy: the Obama administration defended its support for green-transition policies by arguing that they were opportunities for job creation and business development rather than burdensome regulations or inappropriate interventions in the economy. But

Democrats also attempted to clothe their demand policies, such as carbon regulation, in market instruments such as carbon trading, thus providing some armor for the policy initiatives against the attacks of market fundamentalists. By creating new markets, advocates of the green energy transition also encouraged divisions in the industrial field between the fossil-fuel industry and financial capital, which found new investment opportunities in green technology and green financial products. Here, government programs oriented toward research and development, such as the Advanced Research Project Agency-Energy (ARPA-E 2012), provided support to cutting-edge, high-technology projects, which in turn created opportunities for venture capital.

Other policies were consistent with localist movements, that is, movements that supported increased levels of local ownership and control. For example, property-assessed clean energy financing provided a financial mechanism for owners of homes and small businesses to invest in rooftop solar energy without long-term liquidity risks (Hess 2012a, 2013). Monthly repayment could be set up to be roughly equal to monthly energy savings, and at the end of the repayment period, ownership of energy production was partially transferred to the building owners. However, the associations were not necessarily stable. For example, by 2010 rooftop solar energy was receiving billions of dollars of investment from technology companies and the financial services industry, which developed third-party finance agreements that enabled homeowners to benefit from rooftop solar but restricted long-term local ownership (Hess 2013). Thus, a localist form of developmentalism, associated with rooftop ownership financed by local governments, was shifting into a mainstream form of developmentalism, associated with third-party ownership and financing from the technology and financial sectors.

Some of the programs—such as rooftop solarization, home weatherization, and even ARPA-E funding—were less controversial than others, such as high-speed rail (Williams 2011). The latter became a particularly focused target of attack by Republican governors, who framed it not as an economic development strategy but as an example of social liberals' profligacy and corruption by special interests (meaning the unions). In short, green technology was not a single, coherent category; rather, it came to acquire political meanings because of linkages between types of green technology and political constituencies: weatherization with low-income groups and traditional Democratic Party urban constituencies; high-technology development with venture capital and the innovation industries; rooftop solar with localism and later with the financial industry; high-speed rail and wind with steel manufacturers, the construction industry, and unions.²

Uneven Transitions and Scalar Dynamics

At this point the analysis of the green-energy transition has shown two types of unevenness: over time across political administrations and Congressional majorities, and across different types of green technology, which are associated with different political constituencies. Another source of unevenness involves scale, and the analysis of scale disrupts the first-level narrative of blocked institutionalization, that is, the history of how transition policies achieved a brief period of support at the beginning of the first Obama administration, especially during 2009, but were blocked in Congress by the end of 2010. Rather, when one examines the green-energy transition in the U.S. at the state-government level, there is a much more complicated and variegated pattern. Even during the years of 2000-2008, when the Republican administration of George W. Bush blocked almost all green-energy transition proposals (other than some modifications included in omnibus energy bills), there were significant developments in many state governments. Approximately half of the state governments, often in concert with large cities, developed a suite of green industrial policies that included both demand-side measures such as renewable portfolio standards and supply-side policies such as support for business development (DSIRE 2013, Hess 2012a). Furthermore, the developments were often bipartisan and in some cases even supported by Republican governors. Many of the policies were continuous with general economic development programs in the states, where state

governments expanded their support for high-tech industrial clusters to include “clean tech.” Thus, developmentalist ideology, which according to Eisinger (1986) has tended to flounder because of sectional rivalries at the federal government level, has always been more widely accepted at the state government level, where there are recognized industrial strengths and factor endowments that make industrial policy more consensual. Furthermore, dislocations from deindustrialization tend to force Republicans and Democrats alike to endorse strong economic development programs. This section will consider variations across industries and scale related to the green industries in the U.S. Specifically, I will contrast the transition in two industrial fields, biofuels and electricity, and the transition at the federal- and state-government levels.

The development of biofuels is treated here as a “green” technology, although it is highly controversial from land use, social justice, and climate mitigation perspectives. In the U.S. biofuels are associated with inefficient corn-based ethanol, and the extensive use of corn for ethanol production has driven up food prices and led to environmental degradation (Farrell et al. 2006, Runge 2010). Next-generation cellulosic ethanol and algae-based biodiesel may be more environmentally benign than corn- and soy-based biofuels, but they still rely on heavy use of natural resources, including fossil fuels and water. Notwithstanding the shortcomings of biofuels from an environmental perspective, they have received relatively high levels of bipartisan support in the U.S. Although the corn-belt states of the Upper Midwest have been the strongest proponents, states in all regions have agricultural industries and have supported biofuel production. Policy on biofuels tends to avoid the sectional rivalries that have often been the downfall of other industrial policies in the U.S. at the federal-government level. Because of the widespread geographical support for the industry, at the national government level there is a renewable fuels standard. After 2010 bipartisan support for biofuels in the federal government eroded to some degree; for example, in 2012 Congress ended the biofuels subsidy and tariff, and it also placed limits on the cost of biofuels consumed by the military (Pear 2012). However, the underlying support for the industry in the form of a national renewable fuels standard remained in place.

In contrast with biofuels, in the U.S. there is no national renewable electricity standard, and as noted above the attempt to institute one in 2010 led to bitter partisan divisions. However, by the 2000s, some state governments were enacting renewable electricity standards, energy-efficiency goals, and in some cases system benefits charges (which funded green transition policies). In the Northeast, states also developed a regional cap-and-trade system starting in 2008, and California launched a similar program in 2012. Groups of Midwestern and Western states, together with Canadian provinces, also developed plans for the regulation of greenhouse gases. Overall, Democratic Party leaders in city and state governments were stronger supporters of green-energy policies than Republican leaders, but several Republican governors were also supportive. Generally, the states that have been the strongest supporters of a renewable electricity standard are on the West Coast and in the Northeast, but also to some degree in the Midwest. Those states tend to have lower levels of employment in the coal, natural gas, and oil industries, and they also tend to be Democratic Party strongholds (Hess 2012a).

The backlash against green-energy policy at the federal government level can also be seen at the state-government level. Our multivariate analysis of 6000 votes by state legislators on green-energy legislation showed that several of the significant predictors of negative Republican Party support for green-energy legislation, including the shift from President Bush to President Obama, were indicative of a backlash against the Democratic Party (Coley and Hess 2012). The election of Republican governors and legislators at the state government level in 2010 also led to reversals on green-energy policy reforms. For example, New Jersey withdrew from the Regional Greenhouse Gas Initiative, and other states backed away from previous initiatives to move toward cap-and-trade legislation. Republican legislators in Colorado, Michigan, Montana, Ohio, Washington, and West Virginia also attempted to reverse renewable

portfolio standard (RPS) laws (Hess 2012a). Attacks by Republican legislators on unions also weakened one of the significant coalition partners for green-energy reforms. However, in states that retained Democratic Party control over the governor's office and state legislature, there was continued deepening of green-energy policy reforms. Thus, even with the Tea Party mobilization, there were dozens of green-energy reform laws passed in state legislatures in 2011 and 2012. Although most of the laws were passed in "blue" (Democrat-controlled states), some of the laws were passed in states with Republican governors but with growing and strong green-energy industries. Likewise, our analysis of state-government economic development plans and programs indicates that Republican governors were often supportive of clean-technology industries as part of the portfolio of support for economic development (Hess and Mai 2014). Thus, at the state government level developmentalist concerns can be associated with a more bipartisan approach, at least for clean technology industrial policy.

Opportunities for bipartisanship at the state government level were also related to the ideological valence associated with proposed laws (Coley and Hess 2012). Increases in renewable portfolio standards became increasingly controversial after 2009, because Republican opponents could frame them as a tax that households and businesses could ill afford during an economic recession. Thus, Democrats could be portrayed as spendthrift social liberals, but the traditional defense of Democrats, that the policies helped mitigate social inequality, was neutralized, because the "taxes" had a disproportionate effect on lower-income homes due to the relatively high percentage of energy expenditures in the household budgets of lower-quintile homes. In contrast, enabling laws that allowed markets to operate more efficiently in favor of green-energy initiatives in the private sector, such as laws in support of property-assessed clean-energy bonds, tended to achieve higher levels of bipartisan support.

In states where Democrats were firmly in power, such as California, New York, and Oregon, there was considerable legislative and executive activity even after 2010. Under Governor Jerry Brown, California continued its green transition record with dozens of new laws that the governor signed (although he vetoed some, too), and in New York Democratic Governor Andrew Cuomo supported green-transition legislation, openly discussed the reality of climate change, and argued that government should to respond to it (Vielkind 2012). Thus, the narrative that one encounters at the federal government level—the rise-and-fall of a green-energy transition with the corralling of climate science—is only partially accurate at the state government level. Particularly on the West Coast and in the Northeast, Democratic Party leaders continued to deepen green transition policies, to support clean-technology industrial clusters, and to argue for the importance of mitigation and adaptation to climate change. In this sense, significant parts of the U.S. looked more like large portions of Europe.

The variegated pattern is consistent not only with partisan divisions between red (Republican) and blue (Democratic) states; the ratio of "clean-energy" jobs to oil-and-gas jobs is higher in states with strong green-transition policies. For example, the ratio is above 1.0 in states that are leaders in the green-energy policy field: 2.1 for California, 2.5 for Massachusetts, 1.5 for New York, and 7.5 for Oregon. In contrast, the most laggard states for green-energy policy tend to have very strong fossil-fuel industries, such as Louisiana (.13 ratio) and Wyoming (.06).¹ The pattern suggests that some states have reached a tipping point in which the green-energy economy has become more economically powerful than the fossil-fuel industry. For example, in Iowa, where there are developed political constituencies for the state's wind and biofuels industries (and a 2.3 ratio of clean-energy to oil-and-gas jobs), the Republican governor elected in 2010 continued to support those industries (Eilperin 2012, Zimmerman 2011). Furthermore, the trend is toward a gradual transition in relative industrial strength toward more clean-energy jobs, including in "red" states that are generally considered strongholds of anti-green and pro-Republican support (Muro et al. 2011).

As the energy industry undergoes a transition from domination by fossil-fuel firms and jobs to one dominated by green-energy and related jobs, another important change may occur.

The financial industry, such as venture capital, has increasingly become aligned with the rising industry, and it has become more willing to invest in political campaigns that support green-transition policies. For example, in a significant clash in California during 2010, out-of-state oil-and-gas firms, including one associated with Charles and David Koch, supported a ballot proposition that would have indefinitely delayed the implementation of the state's cap-and-trade regime. However, a coalition of labor, environmental, ethnic minority, and clean-tech organizations put together a winning campaign. The campaign framed the ballot proposition as a ploy by "out-of-state" oil interests that wanted to make California's air dirtier, thereby playing a chord of defensive developmentalism against the fossil-fuel industries' austerity message. In addition to the clash of messaging, the coalition outspent the fossil-fuel industry by a two-to-one ratio, with much funding coming from the wealthy donors associated with the state's venture capital and financial services industries (Hess 2012a, National Institute on Money in State Politics 2012).

Conclusion

The problem of explaining why there is a failed or stalled green-energy transition in the U.S. (at the federal government level and in many but not all states) requires a different kind of theory of science, technology, and society than has been typical in the field up to this point. This is not to say that existing conceptual frameworks are irrelevant. Certainly, the idea of coalition politics, which is central to understanding political processes in countries with electoral democracies, involves actors who build networks and negotiate compromises. Likewise, there are long-term transitions underway in LTSs from current configurations based on high levels of fossil-fuel consumption to new, post-carbon configurations. Those transitions require government policy to protect emergent technological "niches," such as solar energy, from market conditions until the new technologies achieve the scale and cost-competitiveness that enable them to compete in markets. Thus, transition dynamics are also important ingredients of a conceptual framework.

However, the study of the politics of the green-energy transition in the U.S. requires a broader framework in order to address the problem of a blocked political opportunity structure. Specifically, I have drawn attention to ideology, field structure, industrial and political power, and scale. In the U.S., the political field is much more subject to industrial influence than in some other countries, due high levels of private spending on political campaigns and a two-party system that tends to absorb and dampen the political extremes that are found in parliamentary systems. Although the system has elections, free speech, and other features generally associated with democratic processes, it functions, especially at the federal government level, more as a corporatocracy. Powerful industrial interests have a tremendous capacity to slow or block even extensive political coalitions, as we have seen in the case of the green-energy policies that failed at the federal government level in 2010, and in this case the fossil-fuel industry has tended to build alliances with political conservatives. However, the industrial field itself is divided, and as the case of the ballot proposition in California indicates, support from a countervailing industry such as finance can be politically crucial. The finance and technology sectors see opportunities in the green transition, and they tend to support a more developmentalist agenda, which when combined with the social liberal agenda of unions and urban constituencies, can be the basis of successful green-transition coalitions for Democratic Party strategists.

As a continental society with a federal government, a blocked political opportunity structure at the federal government level does not necessarily entail similar blockages at other scales of government, and industrial power that is effective at one level may be less so at another level. After 2010 conservative groups such as the American Legislative Exchange Council targeted green-energy policies in state legislatures, but after two years they could not demonstrate much success with their goal of achieving a roll-back of state-level renewable

portfolio standards (Anderson 2011). Furthermore, there are interactions between the state and federal level: experiments in Chicago and California provided models for the Obama administration's green jobs policies, and continued developments in the Northeast and on the West Coast provided a refuge for the further development of green-transition policies after the political opportunity structure closed down at the federal government level in 2010.

In this situation of an uneven transition with a powerful industrial counter-mobilization, scientific research associated with the green-energy transition has lost much of its political effectiveness. The broad corralling of social liberalism, which took place over decades through the gradual construction of conservative think tanks and media (Barley 2010), has been extended to the scientific field. Traditional deference of policymakers to technical expertise, which scientists carefully protect through boundary work and boundary organizations (Guston 2001), has given way to a politicization of climate science and green-energy research. In the crudest forms, they are viewed as corrupt give-aways to special interests that are tainted by an agenda of social liberalism. Here, mappings from the left and the right can converge on meanings of specific technologies, such as weatherization for the poor and high-speed rail for the steelworkers.

More generally, the analysis of ideologies as underlying cultural systems in political fields also has benefits for the historical sociology of contemporary science, technology, and industry. Although the transition in the political field in the U.S. (and in many other countries) during the 1980s and 1990s from the dominance of social liberalism to the dominance of neoliberalism is well recognized, the analysis of ascendant political ideologies such as localism and mainstream developmentalism (both with historical antecedents) enables the study of the historical changes in the political field to escape from a pendulum swing view of history. In the pendulum swing view, the future can become a return to social liberalism, just as a dialectical view of history awaits a revolutionary transformation to socialism. In contrast, the analysis developed here draws attention to the slow rise of mainstream developmentalism in the political field and its ideological foil, localism. The particular form that developmentalism takes in the U.S. is closely connected with the declining relative position of the country in the global economy. The invigoration of industrial policy and defensiveness in trade relations that have emerged since 2000 with respect to green-tech and manufacturing are sites where one can track in some detail these underlying shifts. The interweaving of the green transition in technology with the global economic transition in economic primacy is likely to increase the position of those who advocate more developmentalist positions in the political field. If this diagnosis is correct, the future trend of the political field in the U.S. is more likely to look like the protectionist past of the nineteenth century than the free trade past of the twentieth century. Likewise, rather than the social liberal emphasis on the redistributive and market corrective functions of the state and rather than the neoliberal emphasis on shifting political decision-making to the wisdom of markets, one will find increasing dominance of advocates of an interventionist state but with a razor-sharp focus on making and keeping good jobs and domestic industries in an increasingly innovative and competitive global economy. It remains to be seen how the global hegemon will handle its relative decline. Of the many possible future scenarios, a new developmentalism, especially a greenish one, may turn out to be a relatively benign historical outcome.

Footnotes

1. The values are calculated from comparable employment estimates from the Independent Petroleum Association of America 2009 and Pew Charitable Trusts 2009. Retail petroleum (e.g., filling station) jobs are not counted, and coal industry jobs are not included. The correlation for all 50 states of the jobs ratio with a clean-energy policy index that I developed was .38, $p < .01$.

2. For a more detailed discussion of the ideological valences of specific forms of green technology, see Hess 2012b.

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