

**What is the Energy Policy-Planning Network and Who Dominates It?:
A Network and QCA Analysis of Leading Energy Firms and Organizations**

Abstract

This study examines the structure of the energy industry and the energy policy-planning network (EPPN). I use cross-sectional director interlocks from 2002 to examine the social networks amongst a sample of the largest energy firms, between these firms and the EPPN, and to calculate relative network centrality measures for the firms. I then use qualitative comparative analysis (QCA) to isolate specific combinations of energy firm attributes that are associated with network position. I find that the energy industry has several key intra-firm interlocks that link dominant companies to each other and that the industry is well represented on the boards of EPPN organizations. Additionally, several dominant energy firms provide links between ultra-conservative and moderate policy development organizations. Finally, QCA models suggest that firms with many employees, high revenue, and who produce oil are most likely to hold prominent positions in the EPPN—though above average political campaign contributions offer an alternative path into the network.

C. Wright Mills offered the first comprehensive explanation of arising collusion between government, industry, and the military, essentially indicting the upper echelons of these bureaucratic organizations, and those who inhabit the positions of power within them, as the dominant forces of control in the United States (1956). This new approach to explaining power in the US was decried by a cacophony of pluralist scholars, who claimed that power is too dispersed, and competing interests too divided amongst potential allies for any sustained coalition to dominate the decision-making process (Dahl 1961). In response to both Mills and the pluralist rebuttal, G. William Domhoff recast Mills' general argument in more specific terms by identifying key organizations inside and outside of government, examining the outcomes of several key policy battles between the elite and competing interests, and re-specifying the nexus of power in the United States as a set of four interrelated power networks (2005). Scholars have built off of Domhoff's analysis for the better half of a century, compiling an impressive

compendium of evidence that demonstrates the presence of a ruling elite, as well as relative cohesion within this select community.

Scholarly interest in one of Domhoff's proposed power networks—the policy-planning network—has resulted in a proliferation of studies that track the penetration of corporations into this increasingly influential sociopolitical process. While some studies focus on the most powerful organizations in the national policy-planning network (Mizruchi 1982; Domhoff 1990; Burris 1992; Domhoff 2005), others investigate sector-specific networks (Roose 1975; Dreiling 2000), and a few even examine local planning networks (see Domhoff 2007). The findings at all levels of analysis suggest that elites consistently win policy battles, benefit from policy decisions, and influence the policy-planning network. Though power and influence are thought to be achieved through a number of avenues, power structure research has often relied on the existence of director interlocks when examining corporate influence on the policy development process (Domhoff 1978; Burris 1992; Mizruchi 1996).

In this study, I examine the director interlocks between the energy industry and the sector-specific policy-planning apparatus that concerns itself with developing federal energy policy—or the energy policy-planning network (EPPN). The research question driving this study is: “What are the common attributes of energy firms who are embedded in the energy policy-planning process?”

It should be noted upfront that this study does not pursue the research direction that many power structure scholars have repeatedly called for; that is, determining the consequences of director interlocks on actual activity of a policy-planning organization.

Despite this shortcoming, I would argue that an exploratory examination of the energy power structure is important for several reasons.

First, energy is the foundation of every economic process and transaction that takes place throughout the world (Georgescu-Roegen 1974). Because of this, the energy industry is, arguably, the most important sector in the US economy. While finance has allowed the economy to continually expand via the mechanism of debt, continued growth—despite what some economists and sociologists claim (see Mol and Sonnenfeld 2000 in particular)—is predicated upon a constant, abundant supply of cheap energy. With a growing chorus of geologists and other scientists indicating that we are at or near the peak of production for all three dominant forms of fossil energy (Darley 2004; Deffeyes 2005; Goodell 2006; Simmons 2006)—coal, oil, and natural gas—it is imperative that we formulate a comprehensive understanding of the processes and mechanisms which drive our national energy policy. By unearthing the information necessary to begin a more rigorous examination of the impact of director interlocks on policy organizations, this study provides the groundwork for future research on energy firms and the EPPN.

Second, director interlocks between EPPN organizations and energy firms help to explain a larger power structure research problem. As Burris (1992: 113) points out, policy-planning organizations shifted from a relatively moderate political position in the 1970s to one of conservatism in the 1980s and 1990s, which corresponded with a similar shift in the business community and increasing network cohesion within the policy-planning network. Many attribute this shift to the incorporation of ultra-conservative think-tanks into the policy-planning network via director interlocks, with prominent

business leaders serving as hubs (Useem 1984; Burris 1992). If significant interlocks exist between energy firms and the EPPN (which includes several of the most powerful policy-planning organizations), it would suggest that the energy industry may play a more significant role in elite cohesion than it has previously received credit for.

Finally, the energy sector is dominated by a handful of powerful producers. In addition to examining the EPPN, this study provides an opportunity to identify interlocks between energy firms. At the firm level, the empirical consequences of corporate interlocks include some elements of control (Pfeffer and Salancik 1978), coordination (Davis 1991), and information sharing (Mizruchi 1996), but the most significant (and often studied) finding is the relative political cohesion that correlates with both direct and indirect firm interlocks. By examining corporate political action committees' (PACs) contributions and firm interlocks over a number of election cycles, many studies have demonstrated a significant link between interlocking directorates and political cohesion (Koenig 1979; Clawson and Neustadt 1989; Useem 1979; Burris 2005). Additionally, Mizruchi found that "interlocked firms were more likely than noninterlocked firms to express the same positions on political issues in Congressional hearings" (1996: 285). The uncovering of interlocks between energy firms could help to explain the remarkable political cohesion within the industry (the Center for Responsive Politics found that 86% of all political contributions from the energy industry were directed to Republican candidates or organizations in 2002).

In this analysis, I identify organizations within the EPPN, isolate interlocking directorates between major energy companies, and examine the interlocks between energy firms and the EPPN. To achieve this, I construct a sample of energy firms that

includes the largest coal, electricity, and oil/natural gas producers in the US, as well as the energy sector's top political campaign contributors in 2000 and 2002. Using qualitative comparative analysis, I test the explanatory power of several key firm attributes on firm position in the EPPN. I find that, in addition to a powerful network of interlocks between key energy firms, the number of employees and relative firm size are important attributes of energy firms who are highly embedded in the EPPN.

Data and Methods

For this study, I created a sample of energy firms, constructed the first description of the energy policy-planning network (EPPN), and sampled the EPPN. A cross-sectional model of relations between the sampled energy firms and the sampled EPPN was then constructed using an adjacency matrix. Interlocking directorates are the primary metric of association for this model, as they have proven to be the most available data sources regarding corporate relations and the most widely used within power structure research. Measures of network centrality for each energy firm are derived from the model of relations, then used as dependent variables in three qualitative comparative analysis (QCA) models in an attempt to explain why particular energy firms achieve highly embedded positions within the EPPN.

Energy Firm Sample

To construct the energy firm sample, I began with the largest producers of coal, electricity, and oil/natural gas in the US, as reported by the US Department of Energy's Energy Information Administration (2003a; 2003b). The top twenty energy producers within each sector were determined by: (1) tons of coal produced in 2003, (2) total megawatt-hours of electricity produced in 2002, and (3) total delivered BTUs of

oil/natural gas in 2002. Of these top 60 energy producers, all publicly traded firms were included in the sample (51), while private firms were excluded (9).

Publicly traded firms that ranked in the Center for Responsive Politics' list of top 20 energy sector political campaign contributors for either the 2000 or 2002 election cycles were also added to the sample (15). This resulted in a total sample of 65 unique, publicly traded energy firms.

Energy Policy-Planning Network

For this study, I developed the first energy policy-planning network list. Table 1 lists the 29 organizations identified as the EPPN. The development of overarching federal energy policy stems from several primary agencies and organizations—some are obvious (such as the US Senate and House Subcommittees, US Department of Energy, and the Federal Energy Regulatory Commission), but others require elaboration.

The inclusion of federal executive agencies and legislative committees are self-explanatory, with one exception. President George W. Bush authorized the creation of the National Energy Policy Development Group in 2001 to develop a comprehensive energy policy to guide future energy policies in the decades to come. The task force was headed by Vice President Dick Cheney and included several cabinet secretaries (Treasury, Interior, Agriculture, Commerce, Transportation, and Energy), and a number of intergovernmental representatives. The task force was also staffed by a number of private industry representatives; however, the full number and identity of these individuals is unknown, because Vice President Cheney refused to make the list of members accessible to the public (see *Walker v. Cheney*).

Members of the well-documented top-twenty policy-planning groups in the United States with energy-related policy research areas, and which also perform extensive lobbying, were included in the energy policy-planning network due to their documented political power (Burriss 1992; Domhoff 2005; Burriss 2005). Six research-oriented think-tanks were extrapolated from Burriss' (2005) list of the twenty most influential policy-planning groups in the United States due to the groups' development of energy-related research programs. These included the Brookings Institution, American Enterprise Institute, Council on Foreign Relations, Conference Board, Heritage Foundation, and RAND Corporation. Two more came from the Capital Research Center's (1999) list of top environmental organizations with energy research departments that receive the most donations from corporate foundations (Natural Resources Defense Council and Resources for the Future). The Union of Concerned Scientists was added to this list because of their recent rise in influence in the policy development sphere, most tangibly manifested through their increased testimonial participation in House and Senate sub-committee hearings regarding energy issues.

Other energy-related organizations (especially industry trade groups) whose primary role is lobbying were chosen based on their overall campaign contributions in the 2000 and 2002 election cycles (Center for Responsive Politics). The National Association of Regulatory Utility Commissioners (NARUC) was added because of its central role in coordinating lobbying activities for all state and local public utility commissions. Informal communication with several state agencies and public utility commissions who represent significant energy markets confirmed that state and local

agencies generally rely on their congressional delegation and the NARUC whenever a specific issue arises that will affect their operations.

The EPPN organizational list omits a number of important and influential federal agencies, state agencies, and independent organizations (such as federal electricity marketing agencies (Bonneville Power Administration and Tennessee Valley Authority), US Army Corp of Engineers, Bureau of Reclamation, state public utility commissions, state and regional power planning councils, and smaller interest groups because of their relatively minimal role in actively developing overarching federal energy policy. State and local agencies also have, in most regions, considerable authority in the implementation of energy policy; however, their ultimate regulatory jurisdiction is superseded (and often directed) by the Federal Energy Regulatory Commission. In specific situations where these agencies have a significant role to play, a thorough analysis must consider these organizations' impacts on policy development.

EPPN Sample

20 of the 29 EPPN organizations are included in the EPPN sample. Of the 9 unselected organizations, 6 are executive agencies or branches of the federal government, which preclude simultaneous employment in the private sector. The remaining 3 unselected organizations refused to provide director lists (National Mining Association, Nuclear Electric Institute, and the American Coal Council).

Measures

Network Centrality Analysis Model

A cross-sectional network model of relations examines the director interlocks that occurred between sampled energy firms and the sampled EPPN organizations during

2002. Interlocks between sampled energy firms are also included in the model.

Firms/organizations are the unit of analysis in this model, and individual directors are considered as attributes of their respective firm(s) or organization(s). The model consists of 65 energy firms and 20 EPPN organizations, for a total of 1374 unique directors and 83 interlocks.

Energy firm director information was derived from Standard & Poor's *Register of Corporations, Directors and Executives* (2002), corporate filings with the US Securities and Exchange Commission, *Who's Who in America* (2002), and information provided on corporate websites. EPPN director listings were obtained from organizations' web sites, email correspondence, and yearly tax forms filed with the Internal Revenue Service.

Dependent Variables

Two social network analysis procedures—"closeness" and "betweenness"—were applied to the model of relations to derive key measures of network centrality. These measures serve as dependent variables in the respective QCA models.

"Closeness centrality" is a measure that "focuses on how close an actor is to all other actors in [a] set" (Wasserman and Faust 1994: 183). Closeness scores are a reflection of actual geodesic distances between one firm and their network, and is derived by:

$$C_C(n_i) = \left[\sum_{j=1}^g d(n_i, n_j) \right]^{-1}$$

where any firm's closeness measure (C_C) is the "inverse of the sum of distances from actor i to all other actors" (Wasserman and Faust 1994: 184). This measure is important because central firms can "be very productive in communicating information to...other

[firms],” if they choose to do so (Wasserman and Faust 1994: 183). Higher closeness centrality scores for any given firm indicate less distance between that firm and others within the network—lower scores demonstrate greater distance between a given firm and others within the network. This measure is limited in that it can only assess distances within a completely connected graph or set of network relations, otherwise distances are unreachable and lead to errors in the mathematical formula. Outsiders—that is, non-connected corporations or organizations—are excluded from calculations to mitigate errors brought on by unreachable network distances (Scott 1991). Outsiders are assigned zero as a closeness score for the QCA model.

“Betweenness centrality” is a concept that attempts to measure a specific firm’s power in relation to their position within a network, with respect to other firms. If one firm lies between other firms in a network—meaning that communication or relations must flow through this firm to reach others—they are considered gatekeepers to and between firms. The measure is the probability of a “path from actor j to actor k tak[ing] a particular route” through a network (Wasserman and Faust 1994: 190). This measure assumes:

that lines have equal weight, and that communications will travel along the shortest route (regardless of the actors along the route). Since we are just considering shortest paths, we assume that such a communication follows one of the geodesics. When there is more than one geodesic between j and k , all geodesics are equally likely to be used (190).

Under these assumptions, an individual actor’s betweenness score “is simply the sum of these estimated probabilities over all pairs of actors [g] not including the i th actor,” and is expressed as:

$$C_B(n_i) = \sum_{j < k} \frac{g_{jk}(n_i)}{g_{jk}}$$

To make the resulting betweenness scores comparable across networks, the raw scores are standardized using the following equation:

$$C'_B(n_i) = \left[\frac{C_B(n_i)}{\frac{(g-1)(g-2)}{2}} \right]$$

Higher scores indicate greater betweenness centrality, while lower scores indicate that a firm is more peripheral within a network. A shortcoming of this particular measure is that firms or organizations that are within the network—i.e. not outsiders—receive the same score (zero) as unconnected firms. Any firm that possesses two or more director interlocks receives a betweenness score. In one sense, this measure is biased towards identifying the most dominant actors in a network at the expense of a more nuanced description of network features and actors' positions.

QCA Models and Data Reduction

I construct three qualitative comparative analysis (QCA) models based on several proposed dependent and independent variables. QCA, developed by Ragin (1987), offers researchers an alternative strategy to traditional quantitative and qualitative studies. QCA is more appropriate than a quantitative approach in this case, as the goal is to elucidate “convergent causal conditions” (Ragin 1987: 14), operationalized via firm attributes in this study, that enable particular firms to dominate the energy policy-planning network. Additionally, QCA allows for an examination of necessary and sufficient causes of this domination. Notation of firm-level attributes in the constructed QCA models follows Ragin’s prescription, where upper-case letters refer to the “presence of a condition and lower-case letters indicate an absence” (89).

Dichotomous independent variables for all three models are: institutional stature (S), number of employees (E), total revenue (R), political contributions (P), and sub-sector (O)—these variables are explicated following the descriptions of the dependent variables and QCA models. Summary statistics are found in Table 2.

Dependent Variables and Model

The first model uses a dichotomized dependent variable derived from firms' closeness centrality scores, C , and is expressed as:

$$C = S + E + R + P + O$$

where C is operationalized by assigning a “1” to all firms who possessed a closeness score and a “0” to all others. Additionally, since this model is attempting to isolate the firm attributes that lead to inclusion in the EPPN, all firms who did not have a direct interlock with an EPPN organizations were also scored a “0,” regardless of their accumulated centrality scores.

The second model uses a dichotomized dependent variable derived from firms' betweenness centrality scores, B , and is expressed as:

$$B = S + E + R + P + O$$

where B is operationalized by assigning a “1” to any firm possessing a betweenness score, and all others receive a “0”. Interlocks with other energy firms are included in this model. This model is designed to isolate the characteristics of energy firms that serve as gatekeepers between other firms and EPPN organizations.

The third model attempts to isolate the key attributes of sampled energy firms that lead to their domination of the EPPN. The model is expressed as:

$$D = S + E + R + P + O$$

where dependent variable D is a dichotomous measure of a firm's possession of at least four interlocks with organizations in the EPPN or with other energy firms. Those firms who hold at least four director interlocks are assigned a "1," while those who possess three interlocks or less receive a "0". This model attempts to isolate the most dominant energy firms in the network, and determine if these firms share particular attributes.

Independent Variables

Institutional Stature

Useem (1984) and Mizruchi (1996) propose economic power as a meaningful determinant of a firm's network position. I propose a slightly different measure, institutional stature, which serves as a proxy for both historical economic power and age. Institutional stature (S) is based on the number of times a firm has been listed in the Fortune 500 between 1950-2002. This variable is operationalized by assigning a "1" to those firms who were listed at or above the sample mean (12 times), and a "0" to those listed 11 times or less. I expect institutional stature to be a sufficient, but unnecessary variable in model 1, and to be necessary, but not sufficient in models 2 and 3.

Employees

As the number of people employed by a firm increases, its relative impact on the economy is multiplied. Studies have demonstrated that the economic multiplier effect for an energy firm is difficult to quantify, but tend to be significant (Domac et al. 2005). While studies of the multiplier effect are generally limited to economic activity, other approaches have linked this phenomenon of corporate influence to individual voting patterns (Taylor 1978), local government decisions (Oyinlade and Haden 2004), and to federal policy development (Useem 1979). These studies suggest that a relationship

exists between the number of people a firm employs and the firm's relative sociopolitical power.

The number of people employed by an energy firm in 2002 (E) is derived from Standard & Poor's *Register of Corporations, Directors and Executives* (2002), Fortune 500 listings (2002), and corporate filings with SEC. E is operationalized by assigning a "1" to those "larger firms" who employ more than the sample mean (16,489 individuals), and a "0" to all others (smaller firms). Since the energy firm sample is biased towards the largest producers of energy, I expect this variable (E) to be sufficient but unnecessary in model 1, and necessary but not sufficient in models 2 and 3.

Revenue

Mizruchi (1982) and Oyinlade and Haden (2004) cite revenue as a strong component of firm power, which is a position that is difficult to argue against. However, due to the cross-sectional approach of this study and the volatile nature of yearly profits in the energy sector (Nissen 2006), I do not expect revenue to be a necessary or sufficient factor in determining a firm's network position for any of the proposed models.

Firms' total 2002 revenue (R) data was also obtained from Standard & Poor's *Register of Corporations, Directors and Executives* (2002), Fortune 500 listings (2002), and corporate filings with SEC. R is operationalized by assigning a "1" to those firms who earned more than the sample mean (roughly \$17.5 billion) in total revenue—all others receive a "0".

Political Contributions

Political contributions are indicators of a politically engaged firm (Mizruchi 1992), though recent power structure research has pointed out that firm-level giving

serves a different purpose than individual contributions (Burris 2001). Even so, I would argue that aggregating these two tiers of campaign contributions in an industry that is more polarized in its giving than any other does not unnecessarily conflate the two goals. Rather, in this study, I am attempting to determine if large campaign contributions can elevate smaller companies into the EPPN.

Total political contributions are treated as aggregated employee and firm contributions to political candidates and political action committees in the 2000 and 2002 election cycles, as obtained from the Center for Responsive Politics. *P* is operationalized by assigning a “1” to any firm who contributed more than the sample mean (roughly \$839,000) in the combined election cycles—all else receive a “0”. I expect *P* to be consistent across all three models, being both necessary and sufficient for small firms, but unnecessary and insufficient for large firms.

Sector

The sector variable (*O*) is meant to separate oil/natural gas producers from the electricity generators and coal producers. Historical analysis (Engler 1961; Goodell 2006) suggests that oil producers are the most powerful energy firms due to their strategic position as suppliers of nearly all of the US transportation fuel, high profit margins, and broadly diversified markets.

Those firms who primarily produce oil/natural gas receive a “1,” while all others receive a “0”. I expect this variable to be sufficient, but not necessary in model 1, and insufficient and unnecessary in models 2 and 3.

A Note About the Mean

I chose to dichotomize all but two of the variables in these three QCA models at the mean, though this is an arbitrary cut-off and deserves an explanation. Nearly all (60) of the sampled energy firms meet the commonly cited definitions of “large” (Headd 2000), 41 are Fortune 500 companies, and 55 had revenues in excess of \$1 billion dollars. In short, this sample has skimmed the cream of the corporate crop in US energy production. While the sampled energy firms are undoubtedly more similar in their attributes than any group of randomly sampled US firms would be, the goal of this study is to identify general firm attributes that make these particular energy firms more likely than their peers to be entrenched in the EPPN. To identify those attributes, delineations must be made based on sample characteristics, rather than the greater population.

Hypotheses

To summarize, I expect firms with the following attributes to be present in model 1: smaller oil producing firms (eO), smaller firms that significantly contribute to political campaigns (eP), any firm with institutional stature (S), any large firm (E), and any oil producing firm (O). I expect that larger firms with institutional stature (SE) will be the only companies present in models 2 and 3. These hypotheses are expressed as:

Model 1:

$$C = eO + eP + S + E + O$$

Model 2:

$$B = SE$$

Model 3:

$$D = SE$$

Results

Energy Firm Interlocks

The energy firm sample contains 17 single director interlocks (one individual serving on the board of two corporations), one double director interlock (two corporations sharing two unique directors), and one quadruple director interlock (one individual serving on the board of four corporations). For such a relatively small group of corporations in a highly concentrated sector, this is significant. American Electric Power appears to be an exceptionally well-connected firm, and serves as a prominent hub within the largest network present in the industry. Other prominent firms include Halliburton Corporation, ExxonMobil, the FPL Group, and Ashland Corporation. Within the confines of the energy industry network, it seems that American Electric Power, ExxonMobil, and Halliburton are in dominant “gatekeeper” roles, as evidenced by their relative position. Figure 1 graphically illustrates these network connections.

Energy Firm Presence in the EPPN

The sample of energy firms is highly embedded within the sampled EPPN. Table 3 contains centrality scores of the analyzed corporations and organizations. According to the closeness centrality calculations, the ten most connected corporations in the energy industry are (1) Halliburton Corporation, (2) ExxonMobil, (3) American Electric Power, (4) BP, (5) Conoco, (6) Unocal Corporation, (7) Phillips Petroleum, (8) ChevronTexaco, (9) Duke Energy, and (10) Arch Coal. The most proximate energy policy-planning organizations were the National Petroleum Council, American Petroleum Institute, US Chamber of Commerce, American Enterprise Institute, and American Gas Association.

The ten highest betweenness scores for corporations were accumulated by (1) BP, (2) Phillips Petroleum, (3) ExxonMobil, (4) Unocal Corporation, (5) American Electric Power, (6) ChevronTexaco, (7) Conoco, (8) Duke Energy, (9) Arch Coal, and (10) Williams Companies. Again, the National Petroleum Council was the most central organization, followed by the American Petroleum Institute. The US Chamber of Commerce, American Gas Association, and the RAND Corporation also possessed high betweenness centrality scores. Figure 2 graphically illustrates these network connections.

QCA Model Results

The QCA analysis findings and reduced logical models for (1) energy firm closeness, (2) energy firm betweenness, (3) energy firm domination are presented below.

Model 1: Closeness

Excluded (n=2)

$$C_0 = \text{Serpo}$$

Only two cases of network exclusion were explained in the closeness model—both firms possessed institutional stature, but were small, had revenue lower than the sample mean, did not contribute to political campaigns more than the sample mean, and did not produce oil.

Included (n=28)

$$C_1 = O * (SE + Sr + rp) + so * (E + Rp)$$

Though complicated, this model is able to account for 28 instances of firm inclusion in the EPPN. By factoring the result, we find that oil producers (*O*) are included, even when accompanied by lower than mean revenue and political contributions. Additionally, factoring demonstrates that institutional stature and oil

production are not necessary for inclusion in the EPPN, so long as a firm is either large or has above mean revenue.

Contradictory (n=35)

$$C_X = se * (rP + Po + ro)$$

The high number of contradictory cases in this model creates validity issues. Even so, it appears that smaller firms with lower than mean revenue, and a lack of institutional stature were still able to, in some cases, be included in the EPPN so long as they had political contributions above the mean—though the contributions were not always necessary either (*sero*).

Model 2: Betweenness

Excluded (n=7)

$$B_0 = seRo + Sr * (ePO + Epo)$$

In this model, revenue (*R*) is an insufficient variable (*seRo*). Interestingly, firms with stature and lower than mean revenue (*Sr*) are also excluded, even when they also possess high political contributions and are oil producers (*PO*), or when they are larger firms (*E*).

Included (n=4)

$$B_1 = EO * (SrP + SRp + srp)$$

Larger oil producing firms (*EO*) are present in all four of the explanatory combinations that lead to high betweenness scores. Firms with institutional stature are also present, though, as (*srp*) demonstrates, it is not a necessary condition of inclusion.

Contradictory (n=54)

$$B_X = er * (s + pO) + sEO + SERPO$$

The contradictory cases far outweigh those that were explained in model 2. Even so, the combinations that lead to both high and low betweenness scores elicit useful information. Smaller firms with low revenue (*er*) produced mixed results, even when they had low stature (*ser*), and in cases of low campaign contributions from oil firms (*erpO*). Additionally, larger, non-oil producing firms without stature (*sEO*) had a similar outcome. The most baffling finding is the contradictory result for firms who are the most dominant in every category (as operationalized in this study): the (*SERPO*) firms.

Model 3: Domination

Excluded (n=46)

$$D_o = se * (r + o) + Po * (er + sR) + rpo * (s + e) + SErpO$$

Model 3 offers an explanation for 46 firms regarding domination of the energy network, but does so at a cost to parsimony. Low institutional stature (*s*), small firm size (*e*), and low revenue (*r*) pervades many of the results. Simply being a large oil-producing firm with institutional stature (*SErpO*), or generating high revenue and giving large campaign contributions (*RP*) are not enough to dominate the EPPN. As would be expected, (*serpo*) firms are at a particular disadvantage.

Included (n=4)

$$D_i = EO * (SrP + SRp + srp)$$

Four cases of domination are explained in this model. Larger oil producing firms with institutional stature (*SEO*) are present, though it appears that stature is not necessary (*sErpO*). Revenue (*R*) and political contributions (*P*) appear to have confounding qualities in the presence of (*SEO*).

Contradictory (n=15)

$$D_x = SO * (ERP + erp) + sEo * (rP + Rp)$$

Firms that were hypothesized to dominate (*SE*) do in some cases, but not in others. Firms who possess all of the modeled characteristics (*SERPO*) appear to have contradictory results. Also, smaller oil producing firms with institutional stature, low revenue, and low contributions (*SerpO*) do not follow a pattern. Different combinations of revenue and campaign contributions ($rP + Rp$), when found in conjunction with large, non-oil producing firms with low institutional stature (*sEo*) also produce confounding results.

Discussion

The centrality scores demonstrate that the most financially powerful energy corporations in the United States also enjoy the most central positions in both the energy industry and EPPN. Seven of the ten most “close” corporations are oil and natural gas producers, while six of the ten most “between” corporations are in this highly subsidized, high-profit enterprise. Arguments can be made that this positioning is strategic by the dominant corporations; that is, to protect financial interests or safeguard social cohesion within the network, or both. It could also simply be a result of smaller corporations attempting to gain access to the upper echelons of business community social relations by having a well-connected director serve on their board (Scott 1992), while the policy-planning network is giving the corporations with the most at stake a voice in the policy development process. Without in-depth interviews from corporate recruiters, strategists, or other directors in the energy policy-planning arena, the assumption is that all three proposed arguments carry certain elements of validity.

Burris' research (2005) demonstrated that interlocking directorships are correlated with shared director support for political candidates, and Domhoff (2005) has reviewed small group/social psychology literature on the creation of solidarity within small, intense groups, which corporate boards and policy-planning organizations definitely qualify as. Those research lines suggest that, regardless of the reasoning behind the creation of these close network ties, the ties themselves serve as a mechanism of social cohesion that have the power to either regulate or select for certain behaviors and ideological orientations. Corporate boards are complex social structures comprised of individuals with potentially disparate pursuits; as such, there are obviously other factors that could work in conjunction with or in opposition to network ties to regulate behaviors and ideological orientations. This is one of the fundamental questions that C. Wright Mills grappled with when he asked: "Do the elite determine the roles that they enact...or do the roles that institutions make available to them determine the power of the elite?" (Mills 1956: 24). Unfortunately, this analysis does not offer evidence in support or to the contrary of these questions and claims; however, it does provide an intriguing look at the energy industry and the EPPN that governs it.

Energy Firm Interlocks

Several of the direct interlocks between energy firms seem to follow the traditional cooptation and monitoring hypothesis offered by Selznick (1949). Interlocks between Ameren and Peabody Energy, American Electric Power and Alpha Natural Resources, Dominion Resources and CONSOL Energy, and FPL Group to Alliance Resource Partners are all examples of electricity producers interlocking with their primary coal suppliers. Other interlocks suggest similar rationales; in particular, the

ChevronTexaco and Dynegy interlocks is an example of a firm sending an inside director to the board of a company they own significant stock in.

The large network formed by direct interlocks between American Electric Power, Williams Companies, ExxonMobil, and Halliburton could easily be attributed to an attempt at information sharing—these are four of the largest corporations in the world, all of whom are dependent on a regulatory environment that is permissive of carbon emissions. One individual—William R. Howell—provides the link between these four firms. He also serves as a director for Pfizer and Deutsche Bank (Standard and Poor's 2002).

Even if such a prominent interlock is simply a matter of chance or an attempt at career advancement (Zajac 1988), as could be argued, its existence makes possible a network of significant economic and political clout. The network includes the above-mentioned firms, along with Valero Energy, Southern Company, and Duke Energy—who are also three of the largest energy producers in their respective sectors. All eight of these firms were listed in the Fortune 200 during 2002. Regardless of rationale, its existence has consequences.

In addition to creating cohesion within the energy sector, this network plays a key role in establishing high network density in the EPPN and linking ultra-conservative policy organizations with their moderate counterparts.

Energy Firms in the EPPN

Energy firms also play a crucial role in linking policy organizations with different ideological position together, particularly into the largest hub of the EPPN—the National Petroleum Council (NPC). The most telling example of this phenomenon is the interlock

between the American Enterprise Institute (AEI)—“the flagship of the conservative think-tanks” (Burriss 1992: 115)—and ExxonMobil. This interlock indirectly links AEI with the NPC and the American Gas Association, and into the dominant energy firm network described above. The US Chamber of Commerce, another “ultraconservative” think-tank (Burriss 1992: 117), has double indirect interlocks with the NPC, through TXU Corporation and BP. BP also brings a more moderate group—the Brookings Institution—into contact with the NPC. The Council on Foreign Relations, which is the single most influential foreign affairs think-tank in the US (Burriss 1992: 119), is incorporated into the network via interlocks with ChevronTexaco and Edison International.

EPPN organizations themselves also play an important role within the network. The National Petroleum Council and American Petroleum Institute, two groups that provide specific policy recommendations directly to the US Department of Energy, link smaller, less interlocked energy firms with the networks established by the biggest firms. The US Chamber of Commerce, American Gas Association, and, to a lesser extent, the Independent Petroleum Association of America all play similar roles. These organizations bring together many of the top 20 producers in oil/natural gas, electricity, and coal together under the auspices of formulating policy recommendations for the federal government.

Network Centrality and Firm Attributes

Aside from demonstrating that oil production, large numbers of employees, and high revenue are often sufficient firm-level variables for inclusion in the EPPN, the QCA analysis clarifies very little. The proposed hypotheses for model 1 were generally correct, though the impact of political contributions was not as large as I had predicted.

Still, some of the smaller firms, whose only significant variable was political contributions, were included in the EPPN, though (*P*) was not necessary or sufficient in all cases.

The proposed hypotheses for models 2 and 3—firms must be large and possess institutional stature (*SE*) to have high betweenness scores or dominate the network—were relatively valid, but not universally applicable. The resulting model solutions were identical, but only accounted for 4 out of 15 cases in model 2, and 4 out of 10 cases in model 3. In fact, while several of these explained cases could be factored to *SEO* in both models, several firms possessing these attributes were not dominant. The difference, however, might be found in the accompanying variable; both of the dominant *SEO* cases also possessed either high revenue (*R*) or high political contributions (*P*), while the excluded cases had neither (*rp*). This explanation does not hold for the other dominant combination, which only included large firm size and the oil production variable (*sErpO*). Furthermore, a number of contradictory cases were present in all three models; though this muddles the explanatory power of QCA findings, I propose—despite consistently finding that large oil firms enjoy the most central positions in the network—it is evidence of a larger phenomenon.

The lack of consistency within the QCA models to explain a firm's position in the EPPN could be due to several reasons. First, the variables—while theoretically appropriate—may not fully capture the phenomenon they are attempting to measure. Also, despite my argument for dichotomizing at the mean, the variables may have been poorly operationalized—or perhaps a key variable was simply overlooked. I could offer

a number of criticisms or alternative explanations that focus on the data and its validity, but I think the causal phenomenon exists outside of this study's purvey.

To think that the essence of a complex social structure could be captured through a cross-sectional study with eight dichotomous variables may be inappropriately reductionist. Rather than a product of inappropriate measures, the findings of this study suggest that a firm's position in the network is one of embeddedness (Granovetter 1985). Dominant firms may share particular characteristics, but their position within a given social network is constantly in flux—today's dominant firm may be relegated to the bottom of the heap with the retirement of one director (think back to William R. Howell's unique position). By approaching energy firms and the EPPN with a longitudinal research program and more robust network procedures (such as Ho, Song, and Xing's (2011) dM³B stochastic block modeling technique), we might come closer to explaining the mechanisms that enable firms to embed themselves in these increasingly important policy development networks.

Policy Implications

Offering insight into the policy development process—or at least the “nuts and bolts” of policy crafting—is outside the scope of this study; however, my findings help illuminate a key factor in how the fossil fuel industry has dominated energy policy development and acquired advantageous legislation (Goodell 2006). By sending directors to serve on the boards of key organizations, fossil energy firms appear to have influence over the policy decision space, providing an opportunity to both craft and vet policy proposals before they ever reach decision makers' desks. Similarly, this coordination allows networks of large firms to resolve internal disagreements on strategy

and present a united front in lobbying battles—a situation made even more salient by the recent Supreme Court decision allowing corporations to contribute to political campaigns and causes (Domhoff 2005). With general agreement on the substance of policy decisions hammered out behind closed doors, these large, immensely profitable firms are able to bring their significant financial and social resources to bear on any issue deemed important by the industry.

While many energy analysts bemoan the lack of coherent federal energy policies, my findings suggest a slightly different interpretation: if viewed as a profit maintenance mechanism for oligopolic firms, the United States has a very coherent federal energy policy, directed by and for large, highly embedded energy firms. Evidence of this dominance is found in a recent Environmental Law Institute study (2009), which identified \$72 billion in subsidies to fossil fuel firms between 2002-2008, while the renewable energy sector received \$29 billion over the same period—despite widespread scientific consensus that averting climate or economic (oil supply disruption) crisis requires a reversal of these funding trends. The domination of federal energy policy organizations could also explain why renewable energy firms and their lobbyists have targeted state governments and organizations (Heiman and Solomon 2004); until the renewable sector can dominate the energy policy planning network—and barring a major shift in the sociopolitical landscape—the fossil fuel industry will continue to direct national energy policy.

Conclusion

In addition to building a groundwork for further studies of energy policy development by identifying the organizations that make up the energy policy-planning

network, this study suggests that the largest, most historically powerful oil firms play a key role in maintaining network cohesion within the energy sector and the EPPN. EPPN organizations are also important elements of this network, as they often provide indirect interlocks between firms of varying size and sector. Many energy firms, in turn, link the EPPN organizations with each other, often bringing together disparate ideological positions through indirect interlocks. Though big oil firms dominate the network, several large electricity generators and coal producers serve as important hubs as well.

Many of the EPPN organizations are heavily infiltrated by energy firms, all of whom have a stake in maintaining a status quo national energy policy that privileges fossil fuels. The mere presence of these interlocks, while important and worthy of further investigation, does not provide enough evidence to determine the actual impact that energy firms have on the policy development process. This is an important direction for future studies.

Finally, when taking a *post hoc* look at the corporate make-up of the energy companies examined in this analysis, we find that several large mergers have occurred since 2002. Reliant Energy reorganized into CenterPoint Energy (though the two still exist and offer similar services in different geographic areas); Cinergy was acquired by Duke Energy; Exelon merged with PSEG; Phillips Petroleum merged with Conoco to become ConocoPhillips; Alpha Natural Resources acquired Massey Energy; the FPL Group, after consulting with public relations expert Frank Luntz, renamed themselves “NextEra Energy”; Anadarko Petroleum purchased the Kerr-McGee Corporation; TXU Corporation underwent a leveraged buyout by a trifecta of investment firms (Kohlberg Kravis Roberts, Texas Pacific Group, and Goldman Sachs) and is now known as the

Energy Future Holdings Corporation; and, finally, ChevronTexaco shortened its name to Chevron, then purchased Unocal. These consolidations are important because they create further cohesion within the industry and diversify the holdings of the most dominant energy corporations. Mizruchi (1992) points out that corporate Political Action Committee activity is highly dependent on several factors, one of which is the “degree of diversification of the parent corporation (more diversified firms tend to be more ideological [in their giving])” (98). This added cohesion and diversification indicates that the already ideologically oriented energy industry could become even more polarized in their political contribution activities. The recent Supreme Court ruling (*Citizens United v. Federal Election Commission*) allowing direct, unlimited campaign contributions from corporations to political candidates adds another layer of complication to this phenomenon. More importantly, these corporate consolidations provide an excellent opportunity to determine if broken links are re-established, or if new interlock nexuses arise from the consolidated firms.

In any case, it is clear that a longitudinal approach is necessary (but may not be sufficient) to examine the underlying phenomenon and processes that lead to the domination of the EPPN by particular energy firms.

Table 1.

Energy Policy-Planning Network

| Organization/Agency | Status | Primary Role |
|--|--|--|
| Federal Energy Regulatory Commission | Federal executive agency | Administers and creates energy regulations |
| US Department of Energy | Federal executive agency | Administers and creates energy policy |
| US Dept. of Transportation | Federal executive agency | Oversees natural gas pipeline safety |
| National Energy Policy Development Group | Special Executive Branch Group | Policy development |
| US Senate—Energy and Natural Resources Committee | Sub-committee of US Senate | Policy development and oversight |
| US House of Representatives—Energy and Commerce Com. | Sub-committee of US House | Policy development and oversight |
| National Petroleum Council | Advisory group to US DOE | Policy development |
| American Petroleum Institute | Oil and gas trade association | Lobbying |
| Interstate Natural Gas Association of America | Natural gas pipeline industry trade organization | Lobbying |
| Independent Petroleum Association of America | Oil and gas trade association | Lobbying |
| American Gas Association | Natural gas utility trade organization | Lobbying |
| National Rural Electric Cooperative Association | Cooperative electric utility trade organization | Lobbying |
| Edison Electric Institute | Shareholder-owned electric utilities' trade organization | Lobbying |
| Nuclear Electric Institute | Nuclear energy trade organization | Lobbying |
| National Mining Association | Mining trade organization | Lobbying |
| American Coal Council | Coal industry trade organization | Lobbying |
| National Association of Regulatory Utility Commissioners | Public utility commission trade organization | Lobbying |
| National Association of Manufacturers | Trade organization | Lobbying |
| Business Roundtable | Trade organization/think-tank | Lobbying |
| US Chamber of Commerce | Trade organization | Lobbying |
| Conference Board | Conservative think-tank | Research group |
| Heritage Foundation | Conservative think-tank | Research group |
| The Brookings Institution | Conservative think-tank | Research group |
| Council on Foreign Relations | Conservative think-tank | Research group |
| American Enterprise Institute | Conservative think-tank | Research group |
| RAND Corporation | Conservative think-tank | Research group |
| Natural Resources Defense Council | Liberal think-tank | Research group |
| Union of Concerned Scientists | Liberal think-tank | Research group |

| | | |
|--------------------------|--------------------|----------------|
| Resources for the Future | Liberal think-tank | Research group |
|--------------------------|--------------------|----------------|

Table 2.**Summary Statistics for Dependent and Independent Variables**

| <i>n</i> =65 | Frequency | | Min | Max | Mean | Std. Deviation |
|------------------------|-----------|----|-----|---------|--------|----------------|
| | 0 | 1 | | | | |
| Dependent | | | | | | |
| Closeness | 20 | 45 | 0 | .54 | .21 | .15 |
| Betweenness | 46 | 19 | 0 | .24 | .04 | .07 |
| Domination | 55 | 10 | 0 | 1 | .15 | .36 |
| Independent | | | | | | |
| Inst. Stature | 50 | 15 | 0 | 48 | 12 | 15.5 |
| Employees | 45 | 20 | 24 | 109,000 | 16,489 | 21,378 |
| Revenue | 51 | 14 | 7 | 191,581 | 17,607 | 31,978 |
| Political Contribution | 56 | 9 | 0 | 4601 | 236 | 883,695 |
| Sector | 46 | 19 | 0 | 1 | .29 | .45 |

Table 3.**Measures of Centrality for Energy Firms and the Energy Policy-Planning Network (Outsiders Excluded)**

| | 2002 Fortune 500 Rank | Closeness Centrality | Betweenness Centrality |
|----------------------------|-----------------------|----------------------|------------------------|
| Energy Firms | | | |
| AES Corporation | 201 | 22.3 | 0 |
| Alliance Resource Partners | Not Listed | .22 | 6.0 |
| Alpha Natural Resources | Not Listed | 27.6 | 0 |
| American Electric Power | 13 | 37.4 | 86.0 |
| Anadarko Petroleum | 232 | 27.7 | 33.4 |
| Arch Coal | Not Listed | 35.0 | 118.3 |
| Ashland Incorporated | 225 | 27.9 | 80.4 |
| BP | Not Listed | 36.9 | 177.5 |
| CenterPoint Energy | 26 | 25.1 | 0 |
| ChevronTexaco | 8 | 35.7 | 118.5 |
| Cinergy | 158 | 27.5 | 14.4 |
| CMS Energy | 156 | 21.4 | 0 |
| Conoco | 48 | 37.1 | 102.8 |
| CONSOL Energy | Not Listed | 19.0 | 0 |
| Dominion Resources | 180 | 23.4 | 66.6 |
| Duke Energy | 14 | 36.1 | 124.9 |
| Dynegy Incorporated | 30 | 29.2 | 0 |
| Edison International | 165 | 23.9 | 9.4 |
| Entergy | 200 | 23.8 | 0 |

| | | | |
|---|------------|------|-------|
| Exelon | 135 | 26.5 | 54.0 |
| ExxonMobil | 2 | 39.8 | 213.0 |
| FPL Group | 226 | 26.1 | 43.3 |
| Green Mountain Energy | Not Listed | 26.3 | 0 |
| Halliburton Corporation | 153 | 39.5 | 133.7 |
| Kerr-McGee Corporation | 446 | 32.3 | 0 |
| Kinder-Morgan Incorporated | Not Listed | 32.3 | 0 |
| Marathon Oil | 43 | 32.3 | 0 |
| Massey Energy | Not Listed | 23.8 | 0 |
| Occidental Petroleum | 146 | 21.4 | 0 |
| PG&E | 87 | 25.0 | 0 |
| Phillips Petroleum | 81 | 35.9 | 176.1 |
| PPL | 309 | 25.4 | 5.2 |
| Progress Energy | 227 | 23.8 | 0 |
| PSEG | Not Listed | 25.1 | 11.2 |
| Reliant Energy | Not Listed | 25.1 | 24.11 |
| Southern Company | 188 | 32.3 | 50.9 |
| Sunoco | 163 | 21.0 | 0 |
| TXU Corp. | 58 | 34.5 | 54.1 |
| Unocal Corporation | 278 | 36.1 | 111.0 |
| Valero Energy | 138 | 32.9 | 0 |
| Williams Companies | 174 | 37.1 | 79.0 |
| Xcel | 137 | 33.5 | 89.3 |
| Policy-Planning | | | |
| American Enterprise Institute | | 30.7 | 69.6 |
| American Gas Association | | 33.1 | 198.9 |
| American Petroleum Institute | | 35.4 | 257.8 |
| Conference Board | | 21.9 | 0 |
| Council on Foreign Relations | | 27.6 | 27.8 |
| Edison Electric Institute | | 27.3 | 112 |
| Independent Petroleum Association of America | | 29.2 | 117.3 |
| Interstate Natural Gas Association of America | | 27.2 | 0 |
| National Association of Manufacturers | | 28.7 | 32.3 |
| National Petroleum Council | | 47.4 | 829.7 |
| RAND Corporation | | 28.6 | 93.0 |
| Resources for the Future | | 27.0 | 107.0 |
| The Brookings Institution | | 27.0 | 0 |
| US Chamber of | | 31.0 | 191.0 |

| | | | |
|----------|--|--|--|
| Commerce | | | |
|----------|--|--|--|

Descriptive Network Statistics

Closeness

Mean: 29.4
Std. Dev.: 5.8
Min / Max: 19.0 / 47.4
n: 56

Betweenness

Mean: 69.3
Std. Dev.: 122.4
Min / Max: 0 / 829.7
n: 56

Figure 1.

Graphical Illustration of Energy Firm Interlocks (Outsiders Excluded)

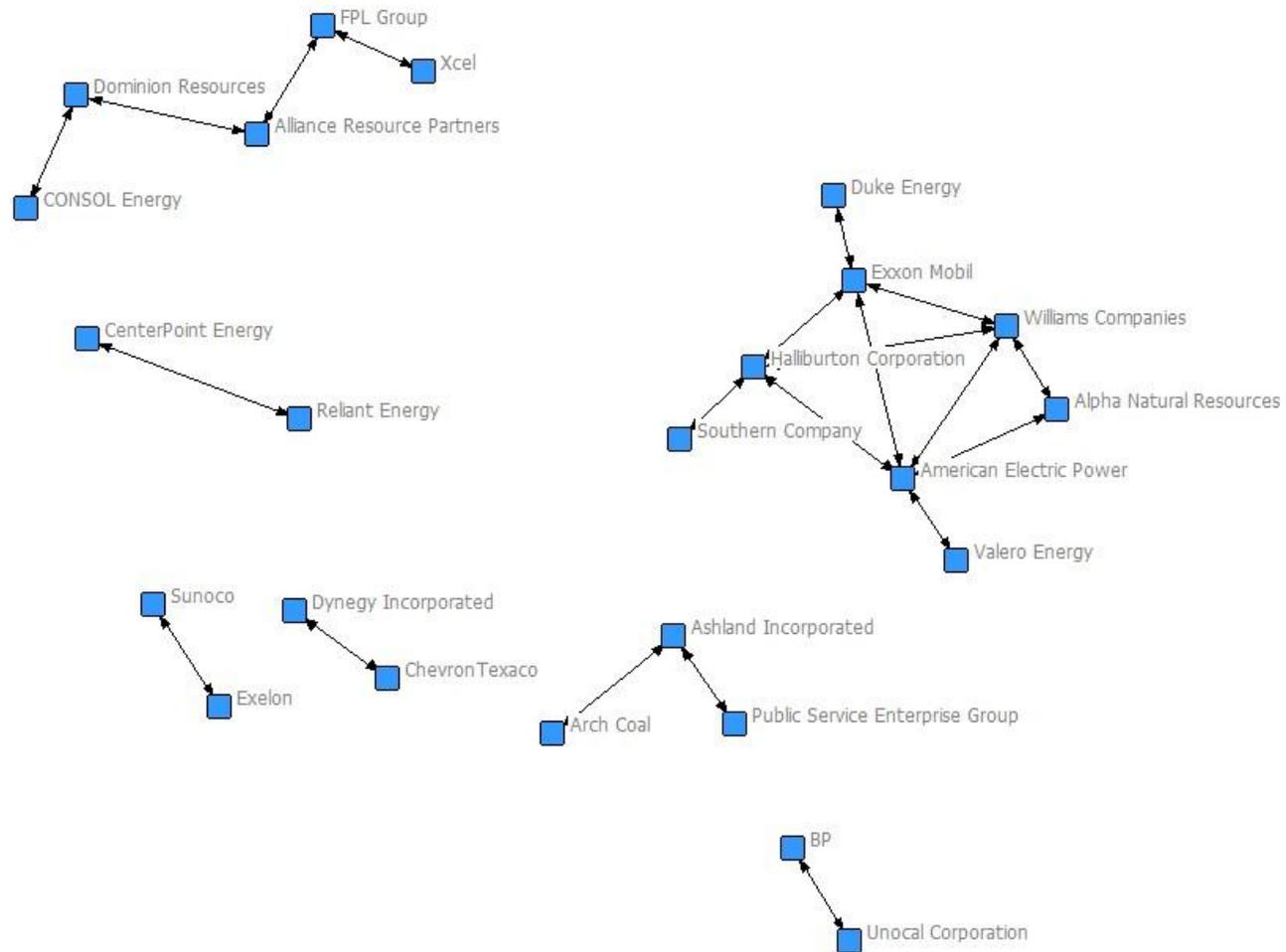
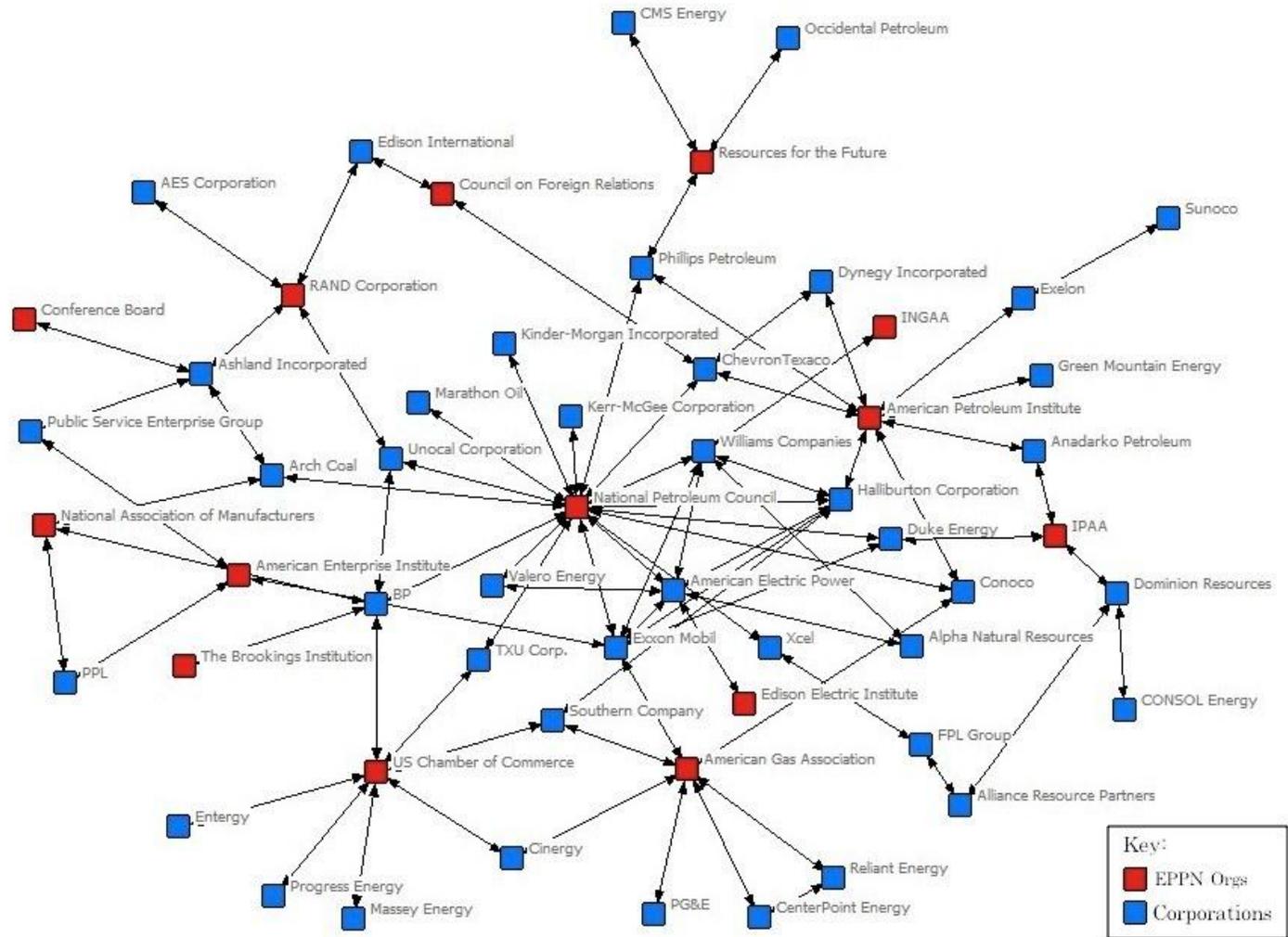


Figure 2.
MDS Network Illustration of Energy Firm and Energy Policy-Planning Network Relations (Outsiders Excluded)



References

- Borgatti, S.P., M.G. Everett, and L.C. Freeman. Ucinet for Windows: Software for Social Network Analysis. Harvard, MA: Analytic Technologies (v. 6.81).
- Burris, Val. 1992. "Elite Policy-Planning Networks in the United States". *Research in Politics and Society*. Ed. by Gwen Moore and J. Allen Whitt. Vol. 4:111-134. Greenwich: JAI Press.
- , 2001. "The Two Faces of Capital: Corporations and Individual Capitalists as Political Actors." *American Sociological Review* 66: 361-81.
- , 2005. "Interlocking Directorates and Political Cohesion Among Corporate Elites." *American Journal of Sociology* 111: 249-83.
- Capital Research Center. 1999. "Corporate Foundations Funding Environment Organizations." Washington, D.C.: Capital Research Center.
- Center for Responsive Politics. "Industry Totals: Oil & Gas." Washington, D.C.: Center for Responsive Politics.
- , "Industry Totals: Coal Mining." Washington, D.C.: Center for Responsive Politics.
- , "Industry Totals: Electric Utilities." Washington, D.C.: Center for Responsive Politics.
- Clawson, Dan and Alan Neustadt. 1989. "Interlocks PACs and Corporate Conservatism." *American Journal of Sociology* 94: 749-73.
- Dahl, Robert A. 1961. *Who Governs? Democracy and Power in an American City*. New Haven: Yale University Press.
- Darley, Julian. 2004. *High Noon for Natural Gas*. White River Junction: Chelsea Green Publishing.
- Davis, Gerald F. 1991. "Agents Without Principles? The Spread of the Poison Pill Through the Intercorporate Network." *Administrative Science Quarterly* 36: 583-613.
- Deffeyes, Kenneth S. 2005. *Beyond Oil: The View from Hubbert's Peak*. New York: Hill and Wang.
- Domac, J., K. Richards, and S. Risovic. 2005. "Socio-economic drivers in implementing bioenergy projects." *Biomass & Bioenergy* 28: 97-106.
- Domhoff, G. William. 1978. *The Powers That Be: Processes of Ruling-Class Domination in America*. New York: Random House.
- , 1990. *The Power Elite and the State: How Policy is Made in America*. New York: Aldine de Gruyter.
- , 2005. *Who Rules America? Power, Politics, and Social Change*. 5th ed. Boston: McGraw-Hill.
- , 2007. "C. Wright Mills, Power Structure Research, and the Failures of Mainstream Political Science." *New Political Science* 29: 97-114.
- Drass, Kriss A. and Charles C. Ragin. 1992. *Qualitative Comparative Analysis 3.0*. Evanston, Illinois: Institute for Policy Research, Northwestern University.

- Dreiling, Michael. 2000. "The Class Embeddedness of Corporate Political Action: Corporate Leadership in Defense of the NAFTA." *Social Problems* 47: 21-48.
- Engler, Robert. 1961. *The Politics of Oil*. Chicago: The University of Chicago Press.
- Environmental Law Institute. 2009. "Estimating U.S. Government Subsidies to Energy Sources: 2002-2008." <http://www.elistore.org/Data/products/d19_07.pdf>.
- Georgescu-Roegen, Nicholas. 1974. *The Entropy Law and the Economic Process*. Cambridge: Harvard University Press.
- Goodell, Jeff. 2006. *Big Coal: The Dirty Secret Behind America's Energy Future*. Boston: Houghton Mifflin.
- Granovetter, Mark. 1985. "Economic Action and Social Structure: The Problem of Embeddedness." *American Journal of Sociology* 91: 481-510.
- Headd, Brian. 2000. "The Characteristics of Small-Business Employees." Washington, D.C.: US Bureau of Labor Statistics.
- Heiman, Michael and Barry Solomon. 2004. "Power to the People: Utility Restructuring and the Commitment to Renewable Energy." *Annals of the Association of American Geographers* 94.1: 94-116.
- Ho, Q., L. Sing, and E.P. Xing. 2011. "Evolving Cluster Mixed-Membership Blockmodel for Time-Evolving Networks." *Proceedings of the 14th International Conference on Artificial Intelligence and Statistics*.
- Koenig, Thomas. 1979. *Interlocking Directorates Among the Largest American Corporations and Their Significance for Corporate Political Activity*. PhD Thesis. University of California, Santa Barbara.
- Mills, C. Wright. 1956. *The Power Elite*. Oxford: Oxford University Press.
- Mizruchi, Mark S. 1982. *The American Corporate Network: 1904-1974*. Beverly Hills: Sage Publications.
- , 1992. *The Structure of Corporate Political Action*. Cambridge: Harvard University Press.
- , 1996. "What Do Interlocks Do? An Analysis, Critique, and Assessment of Research on Interlocking Directorates." *Annual Review of Sociology* 22: 271-98.
- Mol, Arthur P.J., and David A. Sonnenfeld, Eds. 2000. *Ecological Modernisation Around the World: Perspectives and Critical Debates*. Portland: Frank Cass.
- Nissen, David. 2006. "Energy Markets: Understanding Pricing, Policies, and Profits." *Energy Journal* 27: 179-181.
- Oyinlade, A. Olu and Matthew Haden. 2004. "Business Power and Community Governance: A Quantitative Case Study of Perceived Influence of Business Power On Local Government." *Sociological Spectrum* 24: 71-91.
- Pfeffer, Jeffrey and Gerald Salancik. 1978. *The External Control of Organizations: A Resource Dependence Perspective*. New York: Harper and Row.
- Ragin, Charles. 1987. *The Comparative Method*. Berkeley: University of California Press.

- Roose, Diana. 1975. "Top Dogs and Top Brass: An Inside Look at a Government Advisory Committee." *The Insurgent Sociologist* 5: 53-63.
- Scott, John. 1991. *Social Network Analysis: A Handbook*. London: Sage Publications.
- Scott, W. 1992. *Organizations: Rational, Natural, and Open Systems*. 5th ed. Englewood Cliffs: Prentice Hall.
- Selznick, Philip. 1949. *TVA and the Grass Roots: A Study of Politics and Organization*. Berkeley: University of California Press.
- Simmons, Matthew. 2006. *Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy*. New York: Wiley.
- Standard and Poor's Register of Corporations, Directors and Executives*. 2002. Corporations, Volume 1. Charlottesville: McGraw-Hill Companies.
- Standard and Poor's Register of Corporations, Directors and Executives*. 2002. Directors and Executives, Volume 2. Charlottesville: McGraw-Hill Companies.
- Taylor, Stan. 1978. "Parkin's Theory of Working Class Conservatism: Two Hypotheses Investigated." *Sociological Review* 26: 827-842.
- US Department of Energy. 2003a. "2002 Annual Energy Review." Washington, D.C.: Energy Information Administration.
- . 2003b. "2003 Annual Coal Report." Washington, D.C.: Energy Information Administration.
- Useem, Michael. 1979. "The Social Organization of the American Business Elite and Participation of Corporation Directors in the Governance of American Institutions." *American Sociological Review*. 44: 553-72.
- . 1984. *The Inner Circle*. New York: Oxford University Press.
- Wasserman, Stanley and Katherine Faust. 1994. *Social Network Analysis: Methods and Applications*. Cambridge: Cambridge University Press.
- Walker v. Cheney*. 230 F. Supp. 2d 51, 66 n.10 (D.D.C. 2002).
- Who's Who in America*. 2003. Chicago: Marquis Who's Who.
- Zajac, E. 1988. "Interlocking Directorates as an Interorganizational Strategy." *Academy of Management Journal* 31: 428-38.