Using Network Analysis to Study Relationships in Climate and Energy Legislation

Spencer Paragas and Daniel Palamarchuk, with Andy Scerri, Christian Lucero, and Andrew Alexander

1. Introduction

Political scientists study lobbying and donations to legislators by interest groups. It is not possible to claim that donations by fossil fuel and related (utility) interests cause legislators to pass ineffective climate and energy legislation. Yet, analysis of a volume of such activities over time can support less robust interpretive claims that these interest groups use donations (and lobbying) to seek influence among legislators in the context of other interest groups which seek effective climate and energy legislation.

This poster demonstrates the results of a version of network analysis linking donors to legislators who, in the US state of Virginia, were involved in the passage of 600+ climate and energy bills 2015-2021 (hereafter, bills). We scraped publicly available data on each bill and politician involved in the bill's passage through the VA legislature. We connected donations received by these politicians to the bill's outcome, and rendered the results into network maps. The suspected impact of donations on the outcome of the sample of bills suggests influence. This is more pronounced when related to the volume of donations and the industry they originate in. The interconnectivity of individual, group, and company donors and politicians is clearly visible, and suggests a relationship between the volume of donations received by a legislator and their actions in proposing, supporting, or opposing bills.

2. The Legislative Process

Although we are aware of studies of donor and lobbyist influence on climate and energy legislation in select US states (Culhane et al., 2021; Hall et al. 2021; Butler & Miller 2022) and federally (Kim et al. 2021), such work is of limited use for studying legislative processes in VA. Unlike MA (the focus for Culhane et al. 2021) or CO, NE, and WI (foci for Butler & Miller 2022), or indeed federally (as for Kim et al. 2021), VA does not mandate that lobbyists disclose the positions which they take (on behalf of clients) on bills passing before the legislature, nor the specific amounts received from clients for specific purposes. More important for this study, VA does not place strict limits on campaign donations or how they might be spent.

VA is also unique in having very relaxed record-keeping requirements for the legislature and committees. The nonpartisan Center for Public Integrity ranked VA forty-sixth out of the fifty states for its anti-corruption measures for public officials (2020). We were therefore unable to obtain records of what was said in many legislative sessions, records of voting patterns in committee sessions, or public testimony.

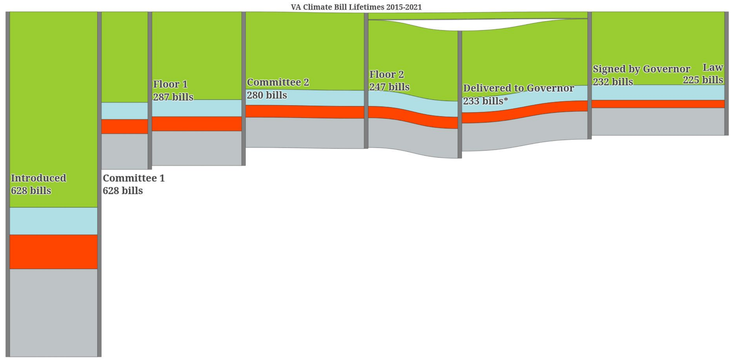

Diagram A (above) shows that over 90% of bills that are not passed into law die in one of various legislative committees (unnamed here as passage from House/Senate to any specific Committee depends on legislator vote). **Green** indicates bills with support of environmental groups (Sierra Club VA Chapter), **blue** environmental group neutrality, **red** opposition, and **grey** no position made public.

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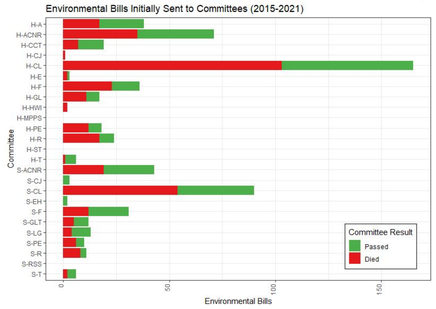
Works cited: Butler, DM. & DR. Miller. 2022. "Does Lobbying Affect Bill Advancement? Evidence from three state legislatures." Political Research Quarterly 75(3):547-561; Culhane, T, G Hall, and JT Roberts. 2021. "Who Delays Climate Action? Interest Groups and Coalitions in State Legislative Struggle in the United States." Energy Research & Social Science 79:12114; Hall, G, T Culhane, & JT Roberts. 2021. Who's Delaying Climate Action in Massachusetts? Twelve Findings. Climate Development Lab. Providence, RI: Institute at Brown for Environment & Society; Kim, IS, J Stuckatz, & L Wolters. 2021. "Strategic and Sequential Links between campaign donations and lobbying." MIT PSCI Dept Research Papers 2021(2):1-37.

3. Committee and Donation Analysis

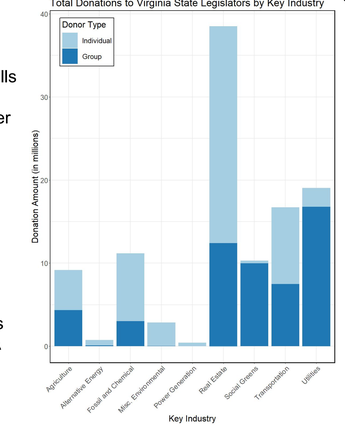


	Combined-CL	Combined-ACNR
Total Donations	$46.2 million	$30.6 million
Dominion Energy	$5.5 million	$3.4 million
Social Greens	$2.6 million	$4.5 million
Mean First Year Elected	2005	2009

Diagram B (top left). Bills are not distributed to committees evenly. Both House (H-CL) and Senate (S-CL) Commerce & Labor committees are important and powerful, and are overseen by senior legislators. They received the most bills. 57.8% of bills originating in the House die in subsequent House committee hearings and 49.8% of bills originating in the Senate die in subsequent Senate Committee hearings. Of note is that 62.4% of bills initially delivered by the House to H-CL die in H-CL, and 60.0% bills delivered by the Senate to S-CL die in S-CL. In another powerful set of committees, 49.3% of bills initially delivered to H-ACNR (Agriculture, Conservation & Natural Resources) die in H-ACNR, while 44.2% of S-ACNR bills die in S-ACNR. Note that in VA, lobbyists may be, and often are, present in committee sessions.

Diagram B1 (bottom left). Legislators in these two sets of committees (CL and ACNR) received significant career donations from the donor groups of interest. Note, however, that Dominion Energy outspent Social Greens in the more important committees (CL), in which more bills died, while the reverse holds for the less important and less aggressive committees (ACNR).

Diagram C (right) provides volumetric analysis of donations. As nationally, the volume of money entering VA politics has increased significantly since 2010, when the Supreme Court lifted the lid on campaign donations. While the VA Real Estate industry and associated individuals by far donate the most money to VA legislators, we discount this effect. Such donors are likely motivated by local (town planning) issues, not climate and energy policy per se. We focus the remainder of our poster on the organizations, corporations, and powerful individuals that donate. These impactful groups represent 1.1% of all the donors but account for 49.7% of the donation money.



4. Network Map

Here, we track relevant donations to **Legislators** serving on at least one committee, 2015-2021 (showing only those over $30k), ignoring all others. **Agriculture** indicates farming and agriculture industries. **Transportation**: auto and transportation. **Alternative Energy**: hydro, wind, and solar power. **Miscellaneous Environmental**: environmental planning and resource efforts outside the other established categories, including non-coal quarries, waste disposal, and issues labeled by the Virginia Public Access Project (VPAP) as "miscellaneous environmental and natural resources".

Following Culhane et al. (2021), we treat **Social Greens** as environmental non-profits identifying as climate advocates, and, alike, see them as "representative of the full range of pro-climate action policy preferences [from 'radical' to 'free-market' greens]" (p.6). Again following Culhane et al. (2021), **Utilities** are regulated companies which provide a public service and include water, gas, and electric power (in VA, by the State Corporation Commission, SCC). **Fossil & Chemical** produce, refine, or distribute natural gas and/or oil. **Power Generation** includes nuclear and electric industries that provide services prior to regulated utilities. **Real Estate** covers sales, real property ownership, land and zoning, mortgages, and licensures.

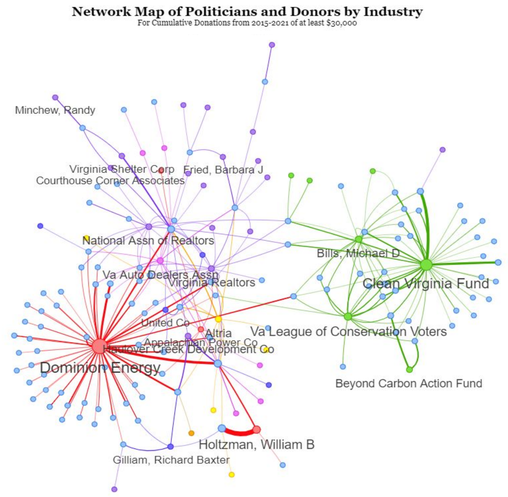


Diagram D (above): Notice the prominence of Dominion Energy (VA's biggest utility monopoly) and various Social Greens (including both radical and free-market factions), as well as the significant separation between the two, indicating that donor-communities who give to one group of legislators do not tend to donate to those who accept donations from the other community. This leads to our supplementary comments. Interestingly, **Miscellaneous Environmental** and **Power Generation** were not significantly represented in this period.

5. Conclusion: Community Analysis

Using the network shown in Diagram D, communities were detected applying the Louvain method. This network clustering algorithm was chosen by the highest resulting modularity. The five communities found are described in Diagram E (below).

Community	1: Dominion Energy	2: Social Greens	3: Real Estate	4: Holtzman Oil	5: Miscellaneous
Politicians	91	41	30	9	36
Party	26 D, 1 I, 64 R	40 D, 1 R	3 D, 27 R	9 R	24 D, 12 R
Chamber	72 H, 19 S	35 H, 6 S	19 H, 11 S	6 H, 3 S	22 H, 14 S
Mean First Year Elected	2010	2016	2006	2009	2003
Donor Groups	21	20	19	9	17
Total Donations	$27.8 million	$11.8 million	$6.0 million	$3.8 million	$4.7 million

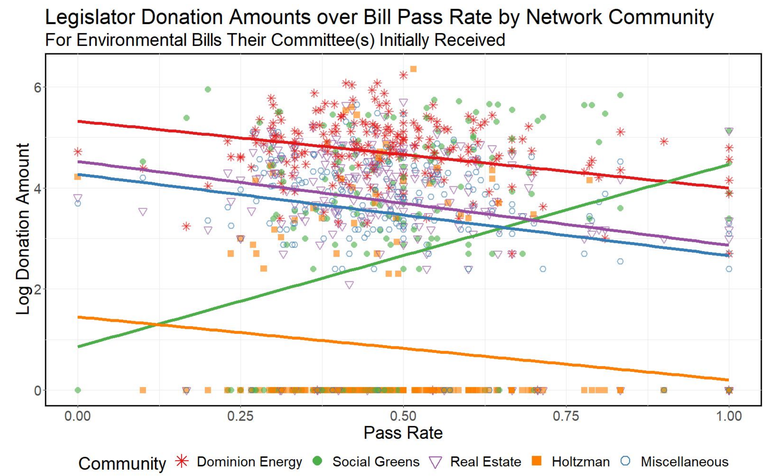


Diagram F (above) indicates that the supposed influence of donors on legislators in four of the communities has a negative correlation with the pass rate of bills. The community consisting of Social Greens, however, has a positive correlation. Subsequent regression models confirm this as well.

The interpretive status of our analysis notwithstanding, it shows clearly that donations by the industries of interest to this study, fossil fuel and related (utilities), appear to correlate with climate and energy bill's tendency to fail in the legislature, notably in the CL and ACNR committees. However, increased donations from Social Greens seem to exert an opposite effect, suggesting that groups from this industry experience yielding returns for their donations to legislators over time.