

American Cap and Trade: How a Years-Long Environmental Effort Fell Into Political  
Oblivion

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Oblivion**

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## **DEDICATION**

To Rita, for always trusting me, and reminding me that I am capable of more than I can even imagine. You have been a wonderful mentor, and a friend, through it all.

To Dr. Kennedy, for proposing corpus analysis, and for diving fully into the details of any insane idea I proposed.

To Dr. Hanke, for introducing me to all of my favorite parts of biology. One day, I hope to know as much about fish as you do.

And to everyone in my life— my family, my coworkers, my best friends— who watched the deadlines pass and pushed me to keep going. Here it is.

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## **ABSTRACT**

The American Clean Energy and Security Act of 2009 is the closest that Congress has come to establishing a national carbon market, and it only passed the House of Representatives. Cap and trade, which was successfully implemented once in the bipartisan 1990 Clean Air Act Amendments, would have allowed high emitters of carbon to choose their own solutions to the problem of high carbon emissions, leaving room for innovation without mandating it. While reflections on the political climate around the bill and economic analyses of its policies abound, little research exists on the speech of the representatives who passed it, and those who voted against it. Using corpus analysis methods such as collocate evaluation and KWIC, this research analyzes the House of Representatives' Subcommittee on Energy and Environment's discussion of the bill. By separating Republican and Democratic speech, this research narrows down three major ideological frameworks on which the parties disagree: belief in anthropogenic climate change, the impact of climate progress on the economy, and the influence of carbon emissions reductions on America's status as a leader. These three frameworks serve as major points of contention between the parties and indicate that the time has come to develop new, compelling approaches to discussing carbon emissions solutions.

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## INTRODUCTION

The American Clean Energy and Security Act (ACES) was passed 219-212 by the House of Representatives in June of 2009, following months of discussion. Yet, the 1400-page bill never received a vote in the Senate; after being read twice, it was placed on the Senate Legislative Calendar, never to be seen again. The failure of the bill, which would have set up America's first federal carbon emissions scheme, has been evaluated in multiple contexts. Theda Skocpol, a prominent political scientist, wrote a post-mortem report for the bill in 2013, explaining the challenges it encountered in its political climate (Skocpol 7). Energy economists such as Robert Baron and Paul Bernstein produced studies of the bill's impact on the economy (Baron et al. 12). Newspapers and think tanks blamed everything from the bill's complexity to a lack of international commitment to lower emission standards for its failure (Broder 2010, Michaels). While the political and economic contexts of the bill have been thoroughly evaluated, there remains a gap in the research: which issues were most prevalent in the minds of American representatives as they debated the bill?

Climate-related corpus analysis has been used to evaluate newspaper or other media texts in order to compare how media in different nations or different time periods has varied in its discussions of climate change (Grundmann and Scott 220; Collins and Nerlich 291). Aside from one 2017 study done by Rebecca Willis, "Taming the Climate? Corpus analysis of politicians' speech on climate change," no corpus analysis has been done on political speech about climate change (Willis 212). Willis' examination of British Parliamentary speech around a climate bill finds that Parliamentary politicians discuss climate change using a technical, economic framing, and she concludes with the suggestion that "[her method] could be used to compare different

discourses between political parties” (Willis 225-226). My research develops that suggestion, using American Congressional speech to evaluate Republican and Democratic ideological framings of ACES; the party differences are particularly relevant given the partisanship around the bill. ACES was passed in the House of Representatives largely by Democrats, with nearly 80% of the votes against it being Republican members of Congress, as opposed to just over 3% of the votes in support of the bill (Office of the Clerk).

Corpus analysis of political speech adds a layer of depth to our understanding of ACES by revealing the ways in which politicians “shape [the] issue to fit with their ideology” (Willis 214). Several researchers have argued that ideological framing impacts future actions on a bill (Shoub 3; Willis 215). Without knowledge of the priorities and mindsets of politicians behind a bill, it is impossible to fully comprehend its failure; corpus analysis provides an opportunity to develop that knowledge. This research aims to understand, in addition to background political and economic impacts, which issues and ideological framings most influenced the bill’s initial success and ultimate failure in Congress.

This document will proceed in eight parts. First, I will provide context, beginning with the history and political background of ACES, which will ground the reader and emphasize the bill’s significance. This background will largely pull from the post-mortem analyses of ACES mentioned above. I will follow with a description of the bill’s contents and the structure of the Congressional hearing, which will allow the reader to understand the rhetoric in more depth. Next, I will describe a few common framing methods around climate change, pulling from research on scale framing as well as technoscientific vs. sociopolitical framing, which will later be referenced in the analysis. Moving forward, I describe my analysis methods, figures, and

tables in the methodology. The results will provide a general overview of the analysis, and the two final sections will analyze the uses of individual keywords in the corpus.

My analysis will conclude that the most significant contrasts between Democratic and Republican ideological framings were skepticism vs. certainty of anthropogenic climate change, the framing of climate progress as an economic threat as opposed to investment, and the debate about whether the bill would cause America to fall behind internationally or lead the world into a new phase of renewable energy.

## **HISTORY AND POLITICAL BACKGROUND**

Cap and trade did not begin in May 2009, when ACES was first introduced. The concept was first instituted successfully in the US with the Clean Air Act amendments in 1990. As stated by the EPA, “an innovative market-based system of marketable pollution allowances... dramatically cut sulfur dioxide emissions, reducing acid rain as well as fine particle pollution that contributes to premature death” (US EPA *Clean Air Act* 1). Specifically, in combination with other programs, “the ARP... helped deliver annual [sulfur dioxide] reductions of over 93% and annual [nitrogen oxides] emissions reductions of over 87%” (US EPA *Acid Rain*). The system worked, more quickly and with fewer costs than anticipated; it passed its emissions target three years early (Siikamäki et al. 3). Not only were emissions reduced, but the American public experienced distinct changes in air quality and acid rain soon afterwards. The American government is faced with a comparable problem today; climate change met with poor infrastructure is creating disasters across the nation, from destructive flooding in Texas to unbreathable, smoke-filled air in California (Risser and Wehner 12457; Williams et al. 892). A

new set of invisible gases is causing distinctly visible problems. Could an old system be repurposed for a novel issue?

Legislators under President George W. Bush, a notorious skeptic of global warming, had the same idea with several bills in 2003, 2005, and 2008. However, the American political climate was not rife with enthusiasm for carbon emissions reductions at the time. As Bush entered the presidency in 2001, he refused to implement the Kyoto Protocol, which had been signed by President Clinton a mere three years earlier (Rosencranz 479). By 2006, there were reports that the Bush administration was attempting to silence climate scientists; NASA's top climate scientist at the time, James E. Hansen, spoke out about this after being pressured not to discuss the implications of his findings in lectures (Revkin). The president was focused on creating a booming economy, and global concerns about climate change fell— or were pushed— to the wayside. With all of this in the background, the cap and trade bills under Bush's administration were destined to fail. Even with the bipartisan leadership of Senators Joe Lieberman, John McCain, and John Warner, the bills did not pass the Senate (Skocpol 30-31).

With the poor political climate of the early 2000s, climate change leaders were left to wait for the ideal moment for substantive climate action such as cap and trade. In the meantime, they focused on funding large environmental organizations, forming agreements with corporate leaders, and executing polling and advertising on climate change. All of this preparation was gearing up to ACES, the bill that would make or break cap and trade in federal American politics. The environmental organizations underestimated the importance of grassroots movements, the corporate deals favored the corporations, and the advertising was too vague to be effective— it pushed for a solution for climate change but failed to disclose the details (Skocpol 44-50). Worse, although the concept of a market-based cap and trade had begun as a Republican

effort with acid rain, the Republican party did not feel the same way about anthropogenic climate change, a more contentious scientific phenomenon. What should have been a bipartisan effort, with the market solution that Republicans favored and the carbon emissions reductions that Democrats believed were necessary, had slowly shifted into a Democrat-led effort in Congress. ACES, unlike the bills under Bush, was headed by Henry Waxman and Ed Markey, two Democrats from California and Massachusetts, respectively. Of the 219 House votes in favor of the bill, 211 were Democrats (Office of the Clerk). Barack Obama's election may have brought Democrats into Congress, but it had not rallied Republican politicians around environmental values.

According to Skocpol's report, lobbying by major carbon emitters and research funded by conservative think tanks pushed Republican congresspeople even further towards climate change skepticism than the general public. By 2006, approximately 20% of Congressional Republicans stated that there was too little spending on environmental protection, compared to just over 50% of Republican Americans polled (Skocpol 58-67). The arguments against climate science by Republican representatives, in part, influenced Republican Americans' perspectives, furthering the political divide on the topic. Notably, Pew Research polls in 2009 and early 2010 also found a consistent lack of public knowledge about cap and trade, with 46% of Americans completely unaware of the policy, although over 50% supported the concept (Kohut 2). This statistic is indicative of a lack of substantial public education efforts by environmental leaders, failing to rally the American public in the face of such challenges. Combined with major conservative media outlets treating the Intergovernmental Panel on Climate Change as a joke and the Tea Party's cap and trade protests and advertisements in mid-2009, conservative belief in

climate change quickly fell in public opinion and in Congress (Skocpol 74-91).

Theda Skocpol's analysis that the Democratic party failed to grasp the significance of grassroots movements in 2010 is complemented by the Republican party's marked awareness of that significance— or, at least, the Tea Party's awareness. The Tea Party came to power shortly before ACES passed the House. As a political movement, its exact founding date varies depending on the source, but it is generally agreed to have begun in the early months of 2009, and it was almost entirely focused on grassroots mobilization. Combining individual political



Figure 1: Timeline of the Tea Party's rise.

*Cap and trade's introduction and passage in the House of Representatives in mid-2009 aligned perfectly with the rise of the Tea Party. The Tea Party's influence is thus crucial to understanding Republican political beliefs at this time.*

initiative with corporate funding— largely from FreedomWorks, an organization founded by David and Charles Koch— the movement grew quickly. Many Americans believed that government spending had gone too far with Medicare spending under Bush and the bank bail-outs that followed the 2008 economic crisis (Formisano 18). With this perceived overspending and overstepping, the Tea Party began its work. Individuals wanted to act, and FreedomWorks was there with financial support and training in hand (Formisano 30). The movement's main positions were that the government had become too large and spent far too much; participants believed that individuals should be responsible for themselves, and that the “conflict [was]... between ‘workers’ and ‘people who don’t work’” (Formisano 25). The government was, in their eyes, supporting the latter while neglecting the former. These beliefs came to a head in the summer of 2009, after the buildup and financial support of grassroots groups turned into

organized protests. On April 15, Tax Day in 2009, Tea Party protestors in over 750 cities took to the streets, encouraged by dozens of commentaries and over 100 commercials run on Fox News (Formisano 32-33). These protests continued; they drew crowds on July 4<sup>th</sup> and disrupted local Congressional town halls in August. By September of 2009, tens of thousands were pouring into the streets of DC to protest a government that had allegedly gotten too big (Formisano 35).

Interestingly enough, the Koch brothers behind FreedomWorks largely earned their money from their “core businesses of refining and distributing oil,” having incurred several fines for environmental harm and spent a significant amount of money lobbying against climate change policy (Formisano 71). Another group funded by the Koch Brothers and largely responsible for the rise of the Tea Party, Americans for Prosperity, created the Regulation Reality Tour, in which staff would attend events and state that the EPA was planning to “hire ‘Carbon Cops’ to regulate churches, refrigerators, and even ‘the air you breathe’” (Fang 117). Another Koch-funded tour, the Hot Air Tour, urged Republicans to refuse any climate action and presumably implied that anthropogenic climate change was all simply hot air (Fang 118). Shortly after the Tea Party came to power and ACES passed in the House, Pew Research Center published a report of its polling on climate change, comparing polls from April 2008 with October 2009. In April 2008, 71% of Americans were found to believe that there was “solid evidence the earth is warming”; in October 2009, that number was down to 57% (Rosentiel). Moreover, for Democrats, the fall was only eight percentage points, while for independents it was 22, and for Republicans, 14 (Rosentiel). The party divide on this issue was not new, but it was quickly widening.

As the 2010 midterm elections neared, what began as a movement of the people against the government quickly became a set of reform guidelines for Congressional Republicans, and



for the Republican party at large (Formisano 38-50). This impact on the Republican party carried over to the narratives created in the discussion of ACES. The disbelief in climate change became quotes such as “Inhaling CO<sub>2</sub>, being exposed to CO<sub>2</sub>, in and of itself is not a health hazard? You are creating CO<sub>2</sub> as you talk to me,” and the Tea Party’s hatred of government spending translated to “cost” as a keyword in the Republican corpus.

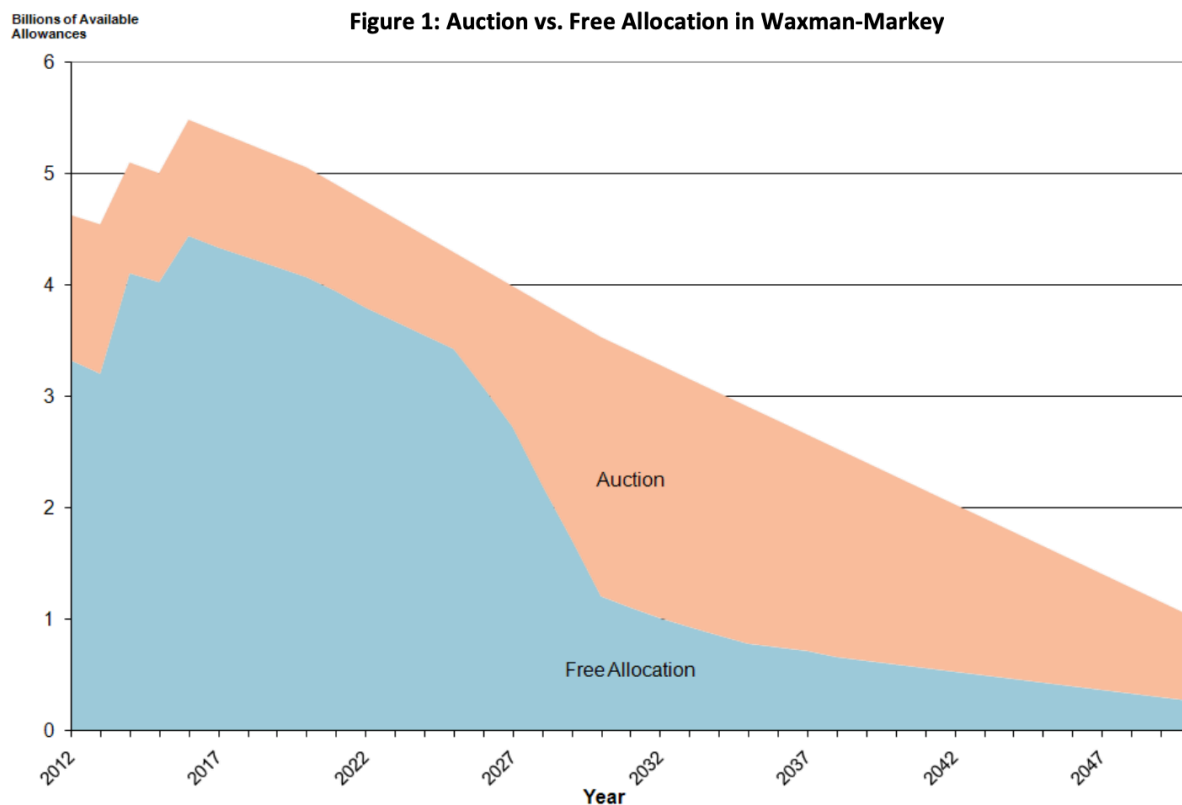
## **I. CONTENTS OF THE AMERICAN CLEAN ENERGY AND SECURITY ACT**

As passed in the House of Representatives, Title I of ACES describes a renewable electricity standard (RES), which typically requires electric utilities to produce and sell a certain amount of their energy through renewable energy sources and with increased levels of energy efficiency. The goals are to “(1) spur growth in renewable forms of electricity vis a vis conventional generating technologies and (2) reduce greenhouse gas (GHG) emissions” (Neimeyer et al. 17). ACES required a 6% standard in 2012 increasing to a 20% maximum in 2020. Yet, according to an MIT study published in August 2009, 29 states had already passed binding standards, and five had non-binding goals. All of these standards, from New York’s 24% by 2013 goal to North Carolina’s 12.5% by 2021, were likely to be nearly as effective as a national standard. Not only that but requiring particular types of energy generation negates the original market-based idea of cap and trade; Congress leaves the methodology of emissions reductions up to the market, but at the same time sets certain requirements on energy production that impact those emissions reductions (Neimeyer et al. 17-20). If the RES became law, several studies cited it as wasting resources (Neimeyer et al. 19 & Montgomery et al. 6) Therefore, the potentially counterintuitive RES is not the shining point of the bill— greenhouse gas cap and trade is.

The premise of cap and trade is to set a continuously decreasing cap on the amount of carbon that can be emitted in the U.S. and give out allowances for that amount of carbon. Each allowance is equivalent to one metric ton of carbon. Allowances are tradeable; in other words, one company can sell its allowances to another, creating a carbon market. Emitters can then decide whether they want to innovate, emit less carbon, and sell their allowances, or if they want to emit more carbon than their allocated allowances and purchase allowances from other companies. Regardless of the decision any individual company makes, the total amount of carbon emitted does not exceed the cap. If a company does emit more than the allowances they are allotted, they are fined for double the cost of the additional allowances used (United States Congress, House).

In the version of ACES that passed the House, the number of allowances was set at 4,627,000,000 from the starting point and fell gradually to 1,035,000,000 by 2050 (United States Congress, House). The EPA Administrator was put in charge of the allowances, with some adjustments to these caps possible over time in the event of emission changes; this flexibility mechanism was put in place, in part, to avoid caps being set so high that emitters had no incentive to curb their emissions (United States Congress, House). In order to counteract price volatility, a minimum carbon price of \$10, adjusted for inflation and increasing 5% annually, was set, and a strategic reserve of allowances was created as well (United States Congress, House). Between 1 and 3 percent of total allowances would be set aside, depending on the year, into the strategic reserve, in addition to any unsold allowances. This reserve would be used to regulate the price of carbon, adding allowances into the supply if the price were to increase too rapidly (United States Congress, House). These tools would allow not only for flexibility but for control of the new carbon market.

As for allocation of allowances, only about 15% would be auctioned when the program began, with the Energy Refund Program sending cash payments to low-income households as support for higher energy costs, and other revenues put towards investment in clean transportation. The percentage of auctioned allowances would increase in future years, allowing more revenues to be put towards such uses (Center for Climate and Energy Solutions).



*Figure 2: Distribution of auction and free allocation allowances in ACES.*

*After 2030, the vast majority of allowances would be auctioned rather than allocated, ending any period of adjustment that ACES may have offered carbon emitters (Center for Climate and Energy Solutions).*

The majority of allocated rather than auctioned allowances would go towards ensuring that the bill does not harm consumers— approximately 23% of allocated allowances would go towards electric and natural gas local distribution companies (LDCs), used “for the benefit of the ratepayers” (Center for Climate and Energy Solutions; United States Congress, House). In other

words, those allowances were required to be used to help consumers, rather than simply allow the business to emit more. In addition to these allowances and those auctioned for low-income families, 20% of allowances, primarily in future years, would become a “climate change dividend” directly to consumers (Center for Climate and Energy Solutions).

Still more allowances— about eight percent— were allocated to ensure the American economy remains intact, and another 15% go towards energy-intensive manufacturing industries that require support in order to remain internationally competitive. These industries range from steel to chemicals, and the allowances are allocated in order to “counter pressures to shift production, jobs, and emissions to countries without comparable carbon reduction programs” (Doniger and Herzog 5). The remainder of allocations would go towards other climate conscious programs and technological development.

## **II. CONGRESSIONAL HEARING STRUCTURE**

To better understand the difficulties of cap and trade within Congress, it is necessary to look at Congressional speech itself. Congressional speech from debates, hearings, and other discussions provides an opportunity to examine what concerns Democrats and Republicans may have had about a bill, and how relevant those concerns might be outside of their political context. For ACES, the largest compiled document of Congressional speech is a legislative hearing held by the House of Representatives’ Subcommittee on Energy and Environment of the Committee on Energy and Commerce (SCEE). A Congressional hearing is “a meeting or session of a Senate, House, joint, or special committee of Congress, usually open to the public, to obtain information and opinions on proposed legislation, conduct and investigation, or evaluate/oversee the activities of a government department or the implementation of a Federal law” (“Congressional

Hearings”). In the case of ACES, the committee hearing’s purpose is to gather more information about and discuss the merit of the proposed legislation. The hearings regarding ACES took place over 4 days in April 2009. The hearings began with an opening statement from each committee member, approximately equally split between the Democratic and Republican parties. These opening statements were followed by witness testimony from experts and researchers, after which members each had 5 minutes to ask questions or respond to the testimony. The speech this study concerns itself with is that of the representatives, and therefore witness testimony is excluded.<sup>1</sup>

The speech is primarily persuasive, argumentative, and exploratory in nature. Each representative is attempting to communicate his or her concerns or approval towards the bill, in an effort to convince others that his or her perspective is correct. The hearing is also set up as an opportunity for representatives to learn more and potentially alter their perspectives on different aspects of the bill. Thus, there are many questions that occur in the speech of a hearing. However, these questions often have an underlying motive, and are rarely purely exploratory. Instead, it is widely found that “members of Congress frequently enter hearings not only with prepared questions, but also with a list of expected answers that result from extended staff interviews (and rehearsals) with potential witnesses,” and that hearings rarely change the minds of the people in the committee, although they may be informative for other members of Congress (Diermeier and Feddersen 51).

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<sup>1</sup> Note: Quotes from SCEE’s hearing on ACES are not cited, as all speech was primarily reviewed through Sketch Engine. All speech being analyzed was taken from that hearing.

### **III. POLITICAL FRAMING OF CLIMATE CHANGE**

Art Dewulf, a professor of sensemaking and decision-making in policy at Wageningen University, argues that framing is an important part of linguistic analysis (Dewulf 321). Speakers consciously or subconsciously use framing in order to communicate a certain perception of an issue. Research has found that climate change is often framed in one of two ways: technoscientific or sociopolitical (Dewulf 322-24). In this text, climate change as a technoscientific problem is often framed either as an economic threat or opportunity, defined by its scientific certainty, and/or approached as a structured problem that requires technological mitigation. According to Dewulf, technoscientific problems are very specific and low-stakes, requiring simple, technical solutions. Sociopolitical problems, on the other hand, tend to be unstructured and difficult to approach. Climate change as a sociopolitical problem can be approached in terms of the equity of a solution, the uncertainty of the outcomes, and the morality of any approach (Dewulf 324).

In the ACES discussion, the tendency was to approach climate change with a technoscientific approach; cap and trade is a market solution, and it is distinctly technical. The major keywords refer to allowances, technology, and scientific definitions of terms like biomass. Yet, the framing of these terms is not exclusively technoscientific. Often, emotional arguments arise that are more sociopolitical, despite their use of technoscientific terms. For example, the analysis shows that Republicans bring up constituents as a way to bolster their argument; they attempt an emotional appeal, stating that their constituents' lives will be unbearable as a result of higher energy prices. Take for instance, the following quote: "California's rates are on average about 65 percent higher than the rest of the nation for electricity, and this truly can be a matter of life and death for my constituents."

Scale framing, defined by Dewulf as “the process of framing an issue at a certain scale and/or level,” becomes particularly relevant here (Dewulf 327). In the ACES discussion, the Republican sociopolitical argument about cost for the constituents can be compared to the larger scale Democrat argument of leadership: “America has the opportunity to be a leader in these issues.” While it is difficult to argue that higher energy costs are going to benefit American individuals in the short term, it is easy to argue that leadership in clean energy will benefit America as a nation in the long term. By framing the issue at different scales, the two parties come to different conclusions.

Framing differences also occur around the science of climate change, the international consequences of ACES, and other issues that are discussed below. The most common type of analysis done using KWIC and collocates was judging whether a word and its collocates had a positive or negative connotation or were framed in a positive or negative light. Across most issues, Republicans were more likely to frame their speech around ACES negatively, while Democrats were more positive or neutral.

#### **IV. METHODOLOGY**

Corpus-based linguistic analysis is the distillation of large bodies of text into linguistic patterns. In order to conduct such analysis, two corpora are necessary: the focus corpus, or the body of text being analyzed, and the reference corpus, which typically consists of comparable, generalized speech. For example, when “Taming the Climate” analyzed Parliamentary speech about climate change, the researchers evaluated Parliamentary speech about climate change in reference to general English speech and Parliamentary speech regarding budgetary decisions (Willis 218-219). Thus, that study used three corpora: one focus corpus of climate change

speech, and two reference corpora– general English speech and budget-related Parliamentary speech (Willis 218-219). My study alters that approach to suit a different question.

I created two focus corpora by collecting speech from SCEE’s hearings on ACES. To examine the differences between how Democrats and Republicans framed ACES in these hearings, I separated the speech by party. This separation resulted in one focus corpus of the hearing’s Republican speech and an additional focus corpus of its Democrat speech. For my reference corpus, I chose a 185,000 word corpus of 2005 Congressional speech compiled by Matt Thomas, Bo Pang, and Lillian Lee of Cornell University. By using Congressional speech from 2005, I was able to compare the speech used by members of Congress when discussing ACES to the speech used in day-to-day Congressional proceedings.

These hearings, excluding the testimony of various industry experts, contain approximately 83,000 words. The Democrat corpus altogether contained 44,694 words, and the Republican corpus contained 39,001. The total text– 83,000 words– is comparable to the Willis study, which used a focus corpus of 97,000 words (Willis 213). While these are not particularly large corpora (Sketch Engine’s reference corpora range anywhere from that size to tens of billions of words), this study was performed without the significant computing power and financial resources necessary to evaluate mass quantities of text. However, these hearings are the largest consolidated body of Congressional speech available about this particular bill. Thus, they are the best way to conduct corpus analysis of political speech around the bill.

The corpus data was analyzed using version 2.36.5 of Sketch Engine, a subscription-based corpus analysis software created by Lexical Computing. While Sketch Engine is not a free software, I chose to subscribe to this version because of its user-friendly interface and its ability to generate concise figures that clearly represent linguistic data. The software allows for various



commonly used forms of analysis including keyword, collocation, and concordance. The software first compiles a corpus by tagging parts of speech. Prior to beginning analysis, the speech was pre-processed. To ensure that speech tagging was consistent between the focus and reference corpora, I converted the focus corpus to lowercase to match the case of the reference corpus. I also compiled a list of over 800 names and stop words and parsed the text for common phrases such as “thank you,” and “I yield my time” so that text irrelevant to the research would not be overrepresented in the analysis. In order to analyze only the speech of current representatives, speech from witnesses called to the hearing was also cut from the text.

After pre-processing was complete, I used Sketch Engine to generate a list of keywords with the following formulas:

Relative frequency

$$fpm_{rmfocus} = \frac{\text{number of hits} \times 1,000,000}{\text{corpus size}} \quad (1)$$

Keyness score

$$Score = \frac{fpm_{rmfocus} + N}{fpm_{rmref} + N} \quad (2)$$

$fpm_{rmfocus}$  refers to the relative frequency of a term in the focus corpus, while  $fpm_{rmref}$  refers to the term's frequency in the reference corpus. *Score* indicates how key a term is in the focus corpus, as defined by comparing its relative frequency in the focus corpus to its relative frequency in the reference corpus. Words with the highest relative frequencies in the focus corpus and the lowest relative frequencies in the reference corpus became the most key. A smoothing parameter,  $N$ , was added to avoid division by zero. The smoothing parameter also determined the type of words rated as the most key. As  $N$  increased, words common in the reference corpus received higher keyness scores; as  $N$  decreased, on the other hand, rarer words in the reference corpus received higher scores (Kilgariff 3).

To gather as many significant keywords as possible, I examined both rare and common keywords using smoothing parameters of 1 and 10,000. The smoothing parameter of 1, recommended by Sketch Engine, results in a list of words that is distinctly climate-related, as seen in table 1. Terms such as “renewable,” “carbon,” and “coal” occur in the top 10 keywords of both parties. In an effort to broaden the analysis, I also set a smoothing parameter of 10,000, allowing terms that are more common in the reference corpus, such as “job,” “industry,” and “standard,” to appear as keywords. Because these terms, taken independently of the corpus, relate less to climate change, they reveal more about the context and underlying themes of the discussion.

Two types of lists were created: keywords from the Democrat corpus against the 2005 reference corpus, and keywords from the Republican corpus against the 2005 reference corpus, with one version for each smoothing parameter (see table 1, table 2). Collocates, or words “habitually juxtaposed with [the target word] with a frequency greater than chance,” were found for the top ten words on each list, in each focus corpus (“Collocate”). Additionally, the keywords

were considered in context (KWIC) to understand the general themes in which they were used and to differentiate themes between parties (see table 3, table 4, etc.). After this point, if a term is stated to occur “in context” of a keyword, that indicates that the word was found in previous or subsequent sentences, typically from the same speaker. If a word is stated to be a collocate, it can be assumed to have grammatical relation to the keyword in question.

A total of 26 keywords were analyzed, including the following: keywords that overlapped in the top 3 of both parties, i.e. occurred both in the top 3 Democrat keywords in a table *and* the top 3 Republican keywords in that same table; and all keywords unique to either party’s table (see table 1, 2). The analysis is done by evaluating the collocates that occur most frequently, examining the context of the keyword using KWIC, and critically reading the surrounding text. The methods of evaluation most relevant to each term are represented through various figures.

The most common figure is a pie chart that represents major collocates for each keyword. Different colors indicate the grammatical relation that a collocate has to the keyword, as labeled on the edge of the chart. The size of the collocate indicates how frequently it occurs in the corpus, while its distance from the center indicates its typicality. Collocates that are further away from the center are frequently found with other terms, while collocates that are closer to the center are typically found with the keyword in question. When visually possible and relevant, all grammatical relations are included for each pie chart. When the wide variety of grammatical relations precludes that, the most significant or relevant relations have been included in the figure. Sketch Engine, however, separates the pie chart graphics by the part of speech that the keyword is used as. For example, “cap-and-trade” can be used as an adjective in “cap-and-trade scheme,” or as a noun in reference to the bill. Sketch Engine generated a diagram for each part of speech. For most words, the vast majority of occurrences are the same part of speech. However,

if 30% or more of a keyword's occurrences appear as an additional part of speech, a table listing all collocates was used rather than a pie chart.

In addition to collocates, this study also includes KWIC tables to provide context for the analysis. When relevant, a distribution graph is also included, showing the parts of the corpus in which a certain keyword or phrase occurs. Such graphs are described in more detail as they occur.

After analysis, the words were separated into major emissions-trading-related topics, determined by background research and the topics' prevalence in the bill. Many words were relevant to multiple issues, and therefore were placed under one issue but provide context for several others.

Finally, the major topics were separated into two sections. The first section of topics contains major concerns about the bill that were identified from background research. Each category in this section begins with introductory information about the issue and is followed by analysis of keywords that relate to the issue. The second section is made up of topics that are more prominent in the text than in background research. This section is primarily made up of linguistic analysis, rather than lengthy background research. Words that could not be easily placed under one issue were also placed in the latter section.

## V. RESULTS

Democrat	Frequency Focus	Frequency Ref	Relative Frequency Focus	Relative Frequency Ref	Score
1. Carbon	105	0	2109.15	0	2110.2
2. Renewable	104	0	2089.07	0	2090.1
3. Electricity	67	0	1345.84	0	1346.8
4. Wind	41	0	823.57	0	824.6
<b>5. Warming</b>	<b>38</b>	<b>0</b>	<b>763.31</b>	<b>0</b>	<b>764.3</b>
<b>6. Greenhouse</b>	<b>32</b>	<b>0</b>	<b>642.79</b>	<b>0</b>	<b>643.8</b>
<b>7. Solar</b>	<b>31</b>	<b>0</b>	<b>622.70</b>	<b>0</b>	<b>623.7</b>
8. Coal	30	0	602.62	0	603.6
9. Allowance	22	0	441.92	0	442.9
<b>10. Electric</b>	<b>21</b>	<b>0</b>	<b>421.83</b>	<b>0</b>	<b>422.8</b>

Republican	Frequency Focus	Frequency Ref	Relative Frequency Focus	Relative Frequency Ref	Score
1. Carbon	92	0	2077.64	0	2078.6
2. Renewable	90	0	2032.47	0	2033.5
3. Electricity	60	0	1354.98	0	1356.0
4. Coal	54	0	1219.48	0	1220.5
5. Allowance	51	0	1151.74	0	1,152.7
6. Wind	51	0	1151.74	0	1,152.7
<b>7. Biomass</b>	<b>44</b>	<b>0</b>	<b>993.65</b>	<b>0</b>	<b>994.7</b>
<b>8. CO<sub>2</sub></b>	<b>41</b>	<b>0</b>	<b>925.91</b>	<b>0</b>	<b>926.9</b>
<b>9. Cap-and-trade</b>	<b>36</b>	<b>0</b>	<b>812.99</b>	<b>0</b>	<b>814.0</b>
<b>10. Hydro</b>	<b>30</b>	<b>0</b>	<b>677.49</b>	<b>0</b>	<b>678.5</b>

Table 1: Keywords with a smoothing parameter of 1.

This table represents the keywords of each corpus (Democrat and Republican) when run with 2005 Congressional Speech as the reference corpus. The smoothing parameter is 1, focusing on rarer words. *In bold are terms that appear in only one top 10 list. For Democrats, these include “warming,”*

“greenhouse,” “solar,” and “electric.” For Republicans, unique terms are “biomass,” “CO<sub>2</sub>,” “cap-and-trade,” and “hydro.”

Democrat	Frequency Focus	Frequency Ref	Relative Frequency Focus	Relative Frequency Ref	Score
1. Energy	293	9	5885.54	41.92	1.6
<b>2. Technology</b>	<b>120</b>	<b>11</b>	<b>2410.46</b>	<b>51.24</b>	<b>1.2</b>
3. Carbon	105	0	2109.15	0	1.2
4. Renewable	104	0	2089.07	0	1.2
5. Job	129	161	2591.25	749.90	1.2
<b>6. Economy</b>	<b>102</b>	<b>72</b>	<b>2048.89</b>	<b>335.36</b>	1.2
<b>7. Climate</b>	<b>78</b>	<b>2</b>	<b>1556.80</b>	<b>9.32</b>	1.2
<b>8. Industry</b>	<b>94</b>	<b>62</b>	<b>1888.19</b>	<b>288.78</b>	1.2
<b>9. US/us</b>	<b>160</b>	<b>318</b>	<b>3213.95</b>	<b>1481.18</b>	1.2
<b>10. Standard</b>	<b>87</b>	<b>62</b>	<b>1747.58</b>	<b>288.78</b>	1.1

Republican	Frequency Focus	Frequency Ref	Relative Frequency Focus	Relative Frequency Ref	Score
1. Energy	234	9	5824.43	41.92	1.5
2. Job	154	161	3477.79	749.90	1.3
<b>3. Cost</b>	<b>134</b>	<b>126</b>	<b>3026.13</b>	<b>586.88</b>	<b>1.3</b>
<b>4. Cap</b>	<b>100</b>	<b>2</b>	<b>2258.30</b>	<b>9.32</b>	<b>1.2</b>
5. Carbon	92	0	2077.64	0	1.2
6. Renewable	90	0	2032.47	0	1.2
<b>7. Emission</b>	<b>88</b>	<b>1</b>	<b>1987.31</b>	<b>4.66</b>	<b>1.2</b>
<b>8. Know</b>	<b>134</b>	<b>213</b>	<b>3026.13</b>	<b>992.11</b>	<b>1.2</b>
<b>9. Percent</b>	<b>103</b>	<b>136</b>	<b>2326.05</b>	<b>633.46</b>	<b>1.2</b>
<b>10. Electricity</b>	<b>60</b>	<b>0</b>	<b>1354.98</b>	<b>0</b>	<b>1.1</b>

Table 2: Keywords with a smoothing parameter of 100.

This table lists the keywords of each corpus (Democrat and Republican) when run with 2005 Congressional Speech as the reference corpus. The smoothing parameter is 10,000, focusing on more

*common words. In bold are terms that appear in only one top 10 list. For Democrats, these include “technology,” “economy,” “climate,” “industry,” “US/us,” and “standard.” For Republicans, unique terms are “cost,” “cap,” “emission,” “know,” “percent,” and “electricity.”*

## **VI. MAJOR CONCERNS SURROUNDING ACES**

This section includes issues found in background research. The background research is provided, and the analysis of words relevant to the issue follow.

### **i. Cost of the bill, and how that will carry over to consumers**

Climate change solutions, from carbon taxes to cap and trade initiatives, have endured a lifetime of dismissals with the excuse of high costs, lost jobs, and ultimately impoverished and unhappy consumers (and thus, constituents). According to Eric Pooley, journalist and former Senior Vice President of the Environmental Defense Fund, this narrative took hold in 1993, with the fight against the BTU/Carbon tax. As the tax was coming close to a vote in the House of Representatives, the National Association of Manufacturers and the U.S. Chamber of Commerce held a press conference, stating that, if it were to pass, “the tax would ‘not only mean the loss of between 400,000 and 600,000 jobs and cost the average family over \$400 a year, it would also hurt American exports’. In years to come, they would learn to inflate these forecasts—millions of jobs lost, and thousands of dollars of new costs per household, became their dependable battle cry” (Pooley ch. 3). At the same time, an anti-tax organization found local economists to create job loss studies, and used press conferences, television, radio, and entire pages of newspapers to advertise and publicize them. When local business owners were upset enough, they would broadcast their tirades against the tax, too (Pooley ch. 3).

Sound familiar? It should. This is the exact order of events that occurred with ACES. The anti-tax organizations of 1993, who began the invented dilemma of choosing between climate action and economic growth, are replaced by the Tea Party and its FreedomWorks and

Americans for Prosperity funding (Fang 10). These organizations riled up grassroots support by claiming that the government's overspending was the woe that takes away from the public's quality of life. As a bonus, they spread misinformation about climate change, painting climate policy as the enemy and using the same fear-mongering techniques that they accused environmental advocates of.

The concerns about cost and job loss are not unfounded, although often overstated by opponents of the bill. With ACES, a study produced at MIT and published in August 2009, an estimate was made that GDP would fall 1.2% and standard of living would fall \$800 by 2020 if the bill became law (Baron et al. 12). Quotes from the bill include that "the economic impacts resulting from the increasing CO<sub>2</sub> allowance prices cascade through the economy and would likely increase energy costs and decrease production and consumption across a wide array of goods and services," and would result in a "loss in household purchasing power" (Baron et al. 13). The study was done based on an incomplete bill, so some amount of it is likely to not be applicable to the final draft, but it remains a valid analysis based on the cost of renewable energy at the time.<sup>2</sup>

While a discussion of the cost of these changes is necessary and the alleviation of those costs, to the extent possible, should be explored, what this discussion fails to acknowledge is the future costs of climate change impacts. The conversation around climate policy has been framed to amplify one cost while ignoring the other.

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<sup>2</sup> It is relevant to note that the cost of renewable energy has largely fallen in recent years, and that this particular study might find cap and trade a more viable option today (Xiao et al. 6).



## Keywords that relate to the concerns about costs of the bill:

### Cost

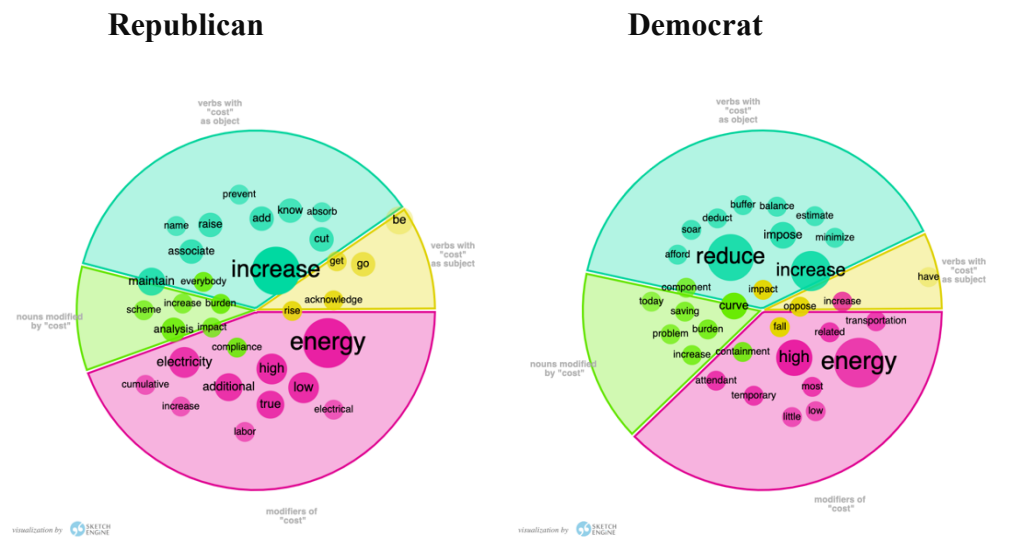


Figure 3: Collocates of “cost” in both corpora.

“Cost” occurs 134 times in the Republican corpus and 84 times in the Democrat corpus, with “increase” and “energy” being common collocates in each.

“Cost” is a Republican keyword when looking at more common terms. The most common Republican collocates for “cost” are “increase” and “energy.” Republicans mention cost 134 times, whereas Democrats do so 84 times. Democrat collocates for “cost” also include “increase” and “energy,” but they also include “reduce” at a higher frequency. The 13 Republican mentions of “cost” and “increase” together include the following: “this cap-and-trade proposal will increase the daily overhead cost for businesses, increase the cost of running our families to work and school and in jobs of businesses”; “so, in other words, you all see this as increasing the cost to the American consumer, the price at the pump and the price of electric power generation?” and “a cap-and-trade energy tax will cost this country millions of good jobs and will force the average American family to pay thousands of dollars in increased energy costs.” Five Democrat mentions of the same collocates include: “In closing, while a cost-benefit

analysis will not be ignored, we need to understand that increased costs and the required change in consumption behavior by our citizens in this country will not represent insurmountable obstacles to the passage of a meaningful energy reform legislation.” and “I would like to think that we have matured and developed as a country, where sometimes, we just do that which is fair, equitable, and right, even though it may increase the cost.” These terms together show the Republican-led narrative of climate action vs. economic growth, and the Democratic pushback to that notion– in this case, with the narrative of American leadership, and in other cases, with the idea that climate action will lead to economic growth.

## Economy

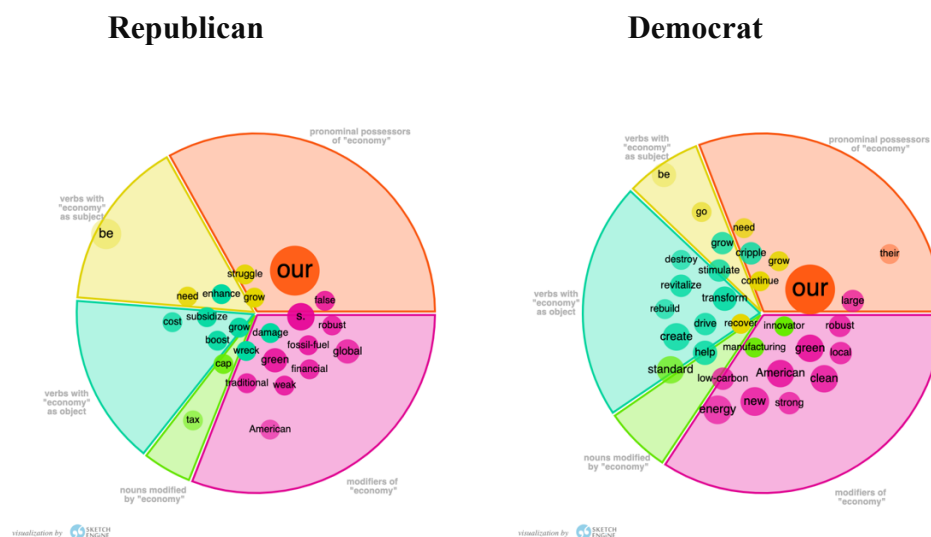


Figure 4: Collocates of “economy” in both corpora.

“Economy” occurs twice as frequently in the Democrat corpus when compared to the Republican corpus, with 102 occurrences in the Democrat corpus and 49 in the Republican corpus. Its main collocate is “our,” and its collocates vary more in the Democrat corpus.

“Economy” is a Democrat top 10 keyword when evaluating with a smoothing parameter of 1. The Democrat corpus includes 102 uses of the term “economy,” compared with the Republican corpus’ 49 uses. By far, the most common collocate of “economy” for Republican representatives is the term “our,” sometimes interrupted by “American” or “energy” or

“financial.” Of these 15 uses, almost all are presented in a negative light, with upwards of 70% speaking about the bill’s negative impacts on the economy (see table 3).

CQL economy + our • 15  
338.75 per million tokens • 0.034%

⚡

Details	Left context	KWIC	Right context
1	doc#0 y and security problems, as well as a vehicle that our	economy	needs to carry us through this economic downturn. i w
2	doc#0 t in its current form, this bill may do more harm to our	economy	than any bill that is likely to come before congress the
3	doc#0 over 7 million jobs that would be lost in our american	economy	. surely at a time when we need to be creating jobs, th
4	doc#0 gas emissions and not cause devastating harm to our	economy	. the discussion draft is incomplete. the most importan
5	doc#0 ve impact that a cap-and-trade bill will have upon our	economy	. i do not believe it is in the best interest of american f
6	doc#0 e question is, can we do this in a way that boosts our	economy	and not hurts it, that creates jobs in america and not s
7	doc#0 y pay for 100 percent. and—it is unacceptable for our	economy	that we waste so much, and we have to work on ways
8	doc#0 n that will have certain and disastrous impacts on our	economy	, or we can legislate an even more harmful system. it i
9	doc#0 rsive package, mr. chairman. if you look at where our	economy	is today, what the unemployment rate is today, where
10	doc#0 y, people get the negative impact that that has on our	economy	, and i think one of you even references peak oil to so
11	doc#0 ny others would have very detrimental effects on our	economy	if it was implemented the way it has been drafted. we
12	doc#0 are talking about---- export millions of jobs out of our	economy	, out of our country, and testimony has been given jus
13	doc#0 many of us are concerned about turning---- our energy	economy	over to a scheme that was devised by companies like
14	doc#0 ie wall street firms---- that have wrecked our financial	economy	. i mean, clearly, there would be big winners and big l
15	doc#0 100 to 60,000 jobs this year, and a \$6 billion hit to our	economy	. that is not global warming. that is not global warming

Table 3: KWIC of “our economy” together in the Republican corpus.

*The majority of occurrences of “our economy” are presented with a negative connotation, from terms such as “harm,” “wrecked,” and “disastrous.”*

Phrases such as “devastating harm,” “detrimental effects,” “wrecked our financial economy,” and “turning---- our energy economy over to a scheme that was devised by companies...” are common in reference to the economy that Republican representatives refer to with the pronoun “our.” This pronoun both personalizes the argument and allows Republicans to argue that the bill will not only harm them, but the entire audience as well.

The most common collocate for “economy” in the Democrat corpus is “our” as well, with 35 of 99 occurrences including it. The persuasive effort is framed differently, however.

CQL economy + our • 35

703.05 per million tokens • 0.07%

>

Sample 15 • 15

301.31 per million tokens • 0.03%

	Details	Left context	KWIC	Right context
1	doc#0	ssing strong energy legislation that will help grow our	economy	, create millions of green jobs and address the global
2	doc#0	ised with rich deposits of energy that have driven our	economy	for decades and through many wars. as we strive for e
3	doc#0	osts impact every segment of our lives. it impacts our	economy	, it impacts our manufacturers and our industries, it im
4	doc#0	rgy security. and most importantly we can bolster our	economy	by creating hundreds of thousands of new green jobs.
5	doc#0	s. and as we move forward in our efforts to retool our	economy	and our workforce it is important that there are safegu
6	doc#0	f 2009. the cars act will help consumers stimulate our	economy	, improve our environment, reduce our dependence on
7	doc#0	are considering will create millions of jobs, revive our	economy	and secure our energy independence. it will also prote
8	doc#0	s whether we will do so in a way that strengthens our	economy	, creates new jobs, and ends our dangerous depende
9	doc#0	: to pass new energy legislation that will revitalize our	economy	, enhance our energy security, create millions of new j
10	doc#0	ing about such an important issue to the future of our	economy	, our national security, and our country. i was very plee
11	doc#0	rs and their ability to supply our country and keep our	economy	going? i would hope that the folks in your industry wou
12	doc#0	of clean energy technology that would drive our local	economy	, and i visited a number of these new regional compar
13	doc#0	ibly concerned about job leakage in any sector of our	economy	, you think there is a significant reason to distinguish t
14	doc#0	eriod our population has grown by 50 percent and our	economy	by over 200 percent. there aren't that many of us in th
15	doc#0	er, given the enormous technological creativity of our	economy	. so i will just ask you this. just a very, very simple que

Table 4: Randomly selected sample of 15 of 35 occurrences of “our economy” in the Democrat corpus. While “our” is still the most common collocate, terms such as “creativity,” “stimulate,” “and “revive” create primarily positive connotations here.

“We are attempting to create a center of clean energy technology that would drive our local economy...” and “I believe, if done right, this bill will serve as an engine to transform our economy” are common phrases in the Democrat corpus, along with terms such as “retool” and “bolster,” which imply potential for growth. Negative implications are still present here, such as “we are all justifiably concerned about job leakage.” However, while in the Republican corpus,

more than 70% of the comments discuss negative economic impacts of the bill, in the Democrat corpus, fewer than 25% of occurrences of “our economy” speak negatively about the economy. Of those 8 negative occurrences, 5 are ultimately followed by a counterpoint, such as “It will be a challenge for our country to transform the way we operate and to transition to a green economy. But the cost of not addressing climate change far outweigh the challenges. We cannot afford to delay but we must be smart,” or “Our economy is in a recession. We are no longer leading in the development of clean energy technology and we are polluting our environment. President Obama is trying to confront these problems. He has said we need a comprehensive energy policy that creates new clean energy jobs...” Thus, the Republican party’s mentions of “our economy,” an emotionally charged phrase, are overwhelmingly more negative towards the bill.

## Cap-and-trade

### Republican

nouns modified by "cap-and-trade"	verbs with "cap-and-trade" as subject	prepositional phrases	"cap-and-trade" is a ...	nouns modified by "cap-and-trade"
<b>scheme</b> 3 11.5 ... cap-and-trade scheme	<b>be</b> 1 6.0 ... cap-and-trade is	... of "cap-and-trade" 5.3% ... ... with "cap-and-trade" 5.3% ...	<b>tax</b> 1 14.0 ... cap-and-trade is a tax	<b>tax</b> 8 11.9 ... cap-and-trade energy tax will
<b>program</b> 3 11.5 ... a cap-and-trade program				<b>system</b> 5 11.3 ... of a cap-and-trade system
<b>plan</b> 3 11.2 ... cap-and-trade plan				<b>proposal</b> 1 10.4 ... cap-and-trade proposal
<b>system</b> 3 10.5 ... cap-and-trade system				<b>provision</b> 1 10.2 ... cap-and-trade provision
<b>proposal</b> 1 10.5 ... cap-and-trade proposal				<b>bill</b> 2 9.7 ... cap-and-trade bill
<b>legislation</b> 1 10.4 ... cap-and-trade legislation				
<b>bill</b> 2 9.7 ... a cap-and-trade bill				

## Democrat

nouns modified by "cap-and-trade"	verbs with "cap-and-trade" as subject	prepositional phrases	adjective predicates of "cap-and-trade"	nouns modified by "cap-and-trade"
<b>package</b> 1 11.5 ... cap-and-trade package	<b>be</b> 1 5.9 ... cap-and-trade is	... of "cap-and-trade" 20.0% ...	<b>wrong</b> 1 13.4 ... cap-and-trade is just wrong	<b>system</b> 5 11.0 ... a cap-and-trade system
<b>system</b> 4 10.7 ... a cap-and-trade system that				<b>program</b> 3 10.3 ... the cap-and-trade program
<b>program</b> 2 9.7 ... the cap-and-trade program must				
<b>bill</b> 1 9.0 ... cap-and-trade bill				

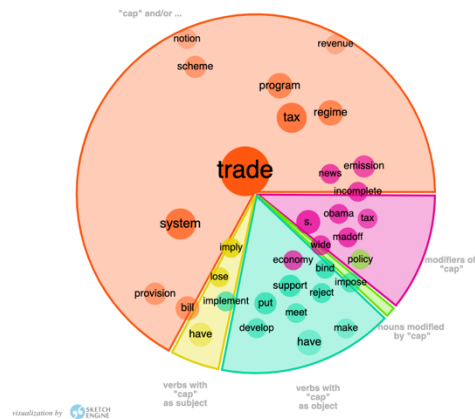
Table 5: Collocates of “cap-and-trade” in both corpora.

Sketch Engine separated “cap-and-trade” uses into noun and adjective for both parties. As a result, all of the collocates are used here for a complete representation. The frequency of each collocate is listed to the right of the word, and the typicality score is listed to the right of the frequency.

The term “cap-and-trade” is a keyword for the Republican corpus and occurs more frequently as an unhyphenated phrase as well. In the Republican corpus, “cap-and-trade” occurs 36 times, and “cap and trade” occurs 73 times. In the Democrat corpus, the hyphenated version occurs 18 times, and the unhyphenated version occurs 22 times. It is clear that Republicans use this phrase substantially more than Democrats do. 33 of the Republican occurrences are in the context of the word “tax,” and 10 include “scheme” in their context. Another 10 include “weakened,” in reference to the United States and its economy. There is a largely negative connotation to these terms, and they reference some of the major Republican opposition to the bill, such as boiling the complex carbon market down to a tax or referring to it as a scheme. Democrats are more likely to refer to “cap-and-trade” or “cap and trade” as a “system” or “program.” Although some Democrats still do refer to cap and trade as a tax, there are very few, and the majority of references to cap and trade are neutral.

## Cap

### Republican



### Democrat

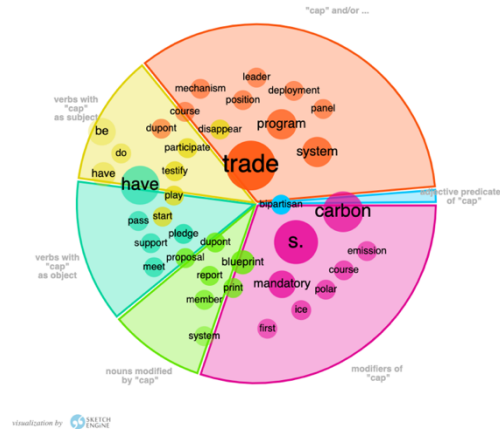
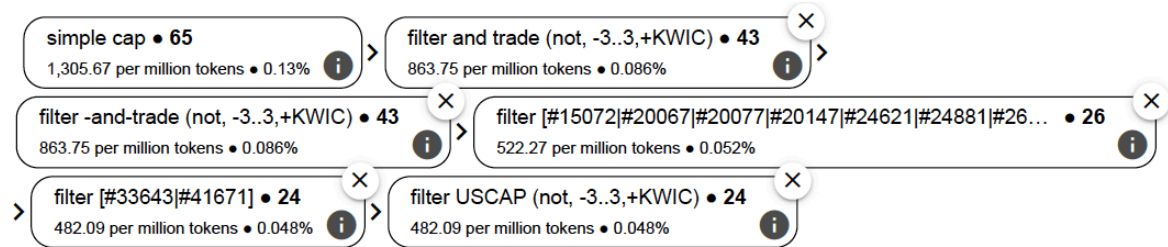


Figure 5: Collocates of “cap” in both corpora.

“Cap” occurs 100 times in the Republican corpus, and 65 times in the Democrat corpus. “Cap” primarily occurs with “trade” in both parties, but also includes major keywords of “carbon” and “have” in the Republican corpus, and “system,” “carbon,” and “s.” as a part of “U.S.” in the Democrat corpus. Despite a higher frequency in the Republican corpus, “cap”’s collocates vary more in the Democrat corpus, with more modifiers, nouns modified by “cap,” and verbs with “cap” as the subject.

Cap is a Republican keyword, and frequently occurs as a part of “cap and trade,” “cap-and-trade,” or “USCAP,” referring to the bill. However, when filtering out those occurrences (as “cap-and-trade” and “cap and trade” have already been analyzed above), there remain 23 Republican occurrences of the word “cap,” and 24 Democrat occurrences (see figure 9, figure 10).





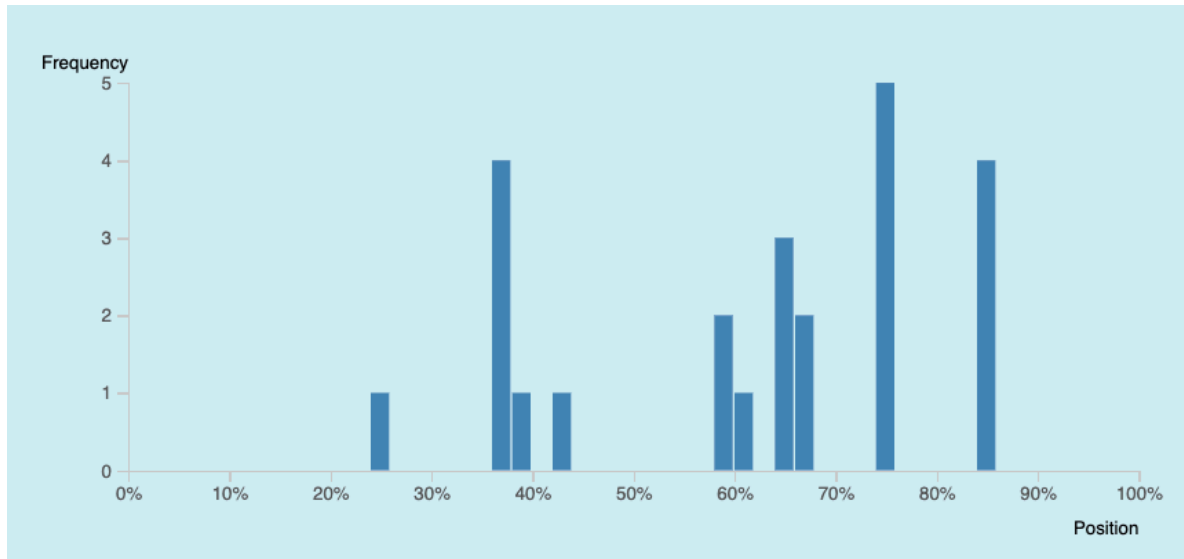
	Details	Left context	KWIC	Right context
1	doc#0 result the majority of them have long supported taking action to		cap	the carbon emissions that are warming our planet. they recogn
2	doc#0 analysis did not measure the overlapping impacts of a carbon		cap	, the renewable electricity standard, the efficiency standards, t
3	doc#0 . the discussion draft both regulates refining through a carbon		cap	and imposes a new gasoline standards for carbon essentially
4	doc#0 e fuels program, the new low carbon program, and the carbon		cap	before we mark up the legislation. is that possible that would lo
5	doc#0 at both of those, the new low carbon program and the carbon		cap	before we get to a markup on the legislation? in this bill, the lo
6	doc#0 e fuels program, the new low carbon program, and the carbon		cap	before we have an opportunity to mark up the legislation? in te
7	doc#0 here is going to be a market base set of incentives to meet the		cap	, and that is the driver to let the market place figure out the mo
8	doc#0 the tundra is melting because of carbon dioxide. the polar ice		cap	is disappearing because of carbon dioxide. the oceans that su
9	doc#0 ificant enough to the united states that we should endeavor to		cap	, to limit the amount of this pollution in the atmosphere, mr. ste
10	doc#0 but would create problems down the line when the emissions		cap	starts to drive down the amount of revenue generated from the
11	doc#0 deal with countries such as india or china which do not have a		cap	of their own? yes or no, please. so you think it is good that the
12	doc#0 no, please. so you think it is good that they should not have a		cap	, and we should? just yes or no. i don't want a lot of toe dancin
13	doc#0 untries such as india and china which may or may not have a		cap	of their own, yes or no? gentlemen, i happen to think that mr. c
14	doc#0 is the job creation potential. the second is, if we do not have a		cap	in the end, would you expect whole scale commercial deploym
15	doc#0 he first question. the second was the relationship between the		cap	and the deployment of this technology. i wanted to ask, you all
16	doc#0 d in 2000: "candidate george bush pledged mandatory carbon		caps	. it was a campaign pledge. what did you think of it at the time?
17	doc#0 ongressman answered: "i think if you have mandatory carbon		caps	, combined with a trading system much like what we did with s
18	doc#0 n plan is essentially what we are doing in this bill, of a carbon		cap	, a trading system, and incentives for the development of entre
19	doc#0 ntrepreneurship. this former congressman went on to say that		caps	with a trading system on sulfur has worked brilliantly, because
20	doc#0 fic reason, of which you are aware, that would make a carbon		cap	system, of the type we have proposed, productive economical
21	doc#0 out there, i hope. you were basically asked if you supported a		cap	on carbon in 1970, which basically is what this bill is. this is--e
22	doc#0 ou said, "i think that if you have a mandatory, have mandatory		caps	, combined with a trading system, much like we did with sulfur,
23	doc#0 i just picking these at random, in the same interview said, "the		caps	with the trading system on sulfur has worked brilliantly. it has b
24	doc#0 eration of systems where you had a combination of a carbon		cap	with a trading system. you had prizes for the invention of majo

Table 6: 24 occurrences of “cap” in the Democrat corpus, excluding “cap-and-trade,” “cap and trade,” and “USCAP.”



*Other exclusions are manual selections of the same terms which Sketch Engine did not automatically filter.*

In the Democrat occurrences, the words that appear most often are “carbon” and “have.” These collocates do not indicate much about the text. When looking at the context of “cap,” the more relevant collocates are “endeavor,” “mandatory,” and “incentive,” as found in the figure 9 occurrences. Phrases such as “majority of [my constituents] have long supported taking action to cap the carbon emissions that are warming our planet...” and “the polar ice cap is disappearing because of carbon dioxide” are present, as is to be expected. On the other hand, there are some other notable patterns. This text is made up largely of questions. “Is that possible that would look at both of those, the new low carbon program and the carbon cap before we get to a markup on the legislation?” and “Yes or no, are you content with the provisions of the bill that deal with countries such as China or India...?” These questions indicate some uncertainty within the Democratic party, and some concerns about international competition as well. They also indicate that the word “cap” may have occurred more often in the witness questioning portion of the hearings than in the introductory statements.



*Figure 6: Distribution of the term “cap,” when not referring to the bill title, in the Democrat corpus.*

*The word is more likely to occur after the 25% mark, indicating that it is more common in the questions than in the introductory statements.*

<div> <div>simple cap • 100 2,258.3 per million tokens • 0.23%</div> <div>filter USCAP (not, -3..3,+KWIC) • 100 2,258.3 per million tokens • 0.23%</div> <div>filter cap-and-trade (not, -3..3,+KWIC) • 100 2,258.3 per million tokens • 0.23%</div> <div>filter [#4502 #5507 #6961] • 96 2,167.97 per million tokens • 0.22%</div> <div>filter [#30385] • 99 2,235.72 per million tokens • 0.22%</div> <div>filter and trade (not, -3..3,+KWIC) • 23 519.41 per million tokens • 0.052%</div> </div>			
	Details	Left context	KWIC
1	doc#0 : emissions coming from all sectors of the country. second, a	cap	implies that we know where we currently stand. we are bettin
2	doc#0 vation. that is something we can address without imposing a	cap	on carbon or establishing a trading platform where sophistica
3	doc#0 ie allowances were distributed, most of the cost of meeting a	cap	on co2 emissions would be borne by consumers who would t
4	doc#0 owledge higher energy prices would result from an emission	cap	here as well. in fact, they rely on it. this will force manufactur
5	doc#0 esident, president obama, has said during the campaign that	capping	carbon and trading emissions would make electricity bills nec
6	doc#0 olicies. all one has to do is to examine the results of the eu's	cap	and tax scheme. it was a failure. co2 emissions in the u.s. fel
7	doc#0 ies grew at a near identical pace in 2006 of about 3 percent.	cap	and tax, cap and trade, will essentially kick working families v
8	doc#0 r. just wait till they get their hands on their utility bills under a	cap	and tax. in 2008, approximately 21 percent of all utility accou
9	doc#0 ng, and this is no time to throw in the towel all in the name of	cap	and tax. so i guess, mr. chairman, you can put my name as u
10	doc#0 nt them. so be careful when you tell us that. the proposal for	cap	and tax will raise the energy rates for producing everything in
11	doc#0 itutive. dr. chu, has china agreed to an international regime to	cap	carbon dioxide? not yet. how about india? has india agreed to
12	doc#0 w about india? has india agreed to an international regime to	cap	carbon dioxide or other greenhouse gasses? administrator ja
13	doc#0 i would like to ask each one of you, what evidence does u.s.	cap	have that china and other developing nations would not take
14	doc#0 osition. give me some evidence that you might have that u.s.	cap	has that china and other developing nations wouldn't take str
15	doc#0 l of profits by the utilities. i guess the question is isn't the u.s.	cap	just sort of a grand bargain to get the business support in ex
16	doc#0 it it said, but i couldn't pronounce it. what evidence does u.s.	cap	have that china and other developing nations will not take str
17	doc#0 : that we've talked about. in my district, we actually make the	cap	, which weighs 32,000 pounds, on the 80 meter wind turbines
18	doc#0 there is no reason to use less of the commodity that is being	capped	, is there, if there is no cost to it? my time has almost expired
19	doc#0 ist. right? by setting a price signal. well, you are not putting a	cap	on the total quantity. you are putting a cap on the quantity pe
20	doc#0 u are not putting a cap on the total quantity. you are putting a	cap	on the quantity per industry, and then charging for that for an
21	doc#0 at you have just mentioned, do any of those have any kind of	cap	policy on greenhouse gases, specifically carbon? and so, you
22	doc#0 tem from the refusal of china and india to adopt firm, binding	caps	on their domestic emission. how do you explain the statemen
23	doc#0 the next week or two. i want to make sure that we don't have	caps	on emissions before we have technology that can actually m

Table 7: “Cap” KWIC in Republican corpus, excluding “cap and trade,” “cap-and-trade,” and “USCAP.”

In the Republican occurrences of the term “cap,” 5 of 23 include “cap and tax” and “cap and tax scheme.” Excluding those occurrences, 8 relate to international issues, with “China,” “India,” and/or “international” in their context. The others include discussions of higher energy prices (“increasing cost... by setting a price signal,”) and insufficient technology (“I want to

make sure that we don't have caps on emissions before we have technology that can actually make sure that we get to those"), and concerns about costs for constituents ("capping carbon and trading emissions would make electricity bills necessarily skyrocket").

## **ii. Allowance Allocation**

How allowances would be allocated was a huge concern in ACES, primarily because the discussion draft of the bill failed to specify it. A New York Times article reviewing the draft states, "But the Waxman-Markey proposal does not address how pollution allowances would be distributed or what percentage might be auctioned or given free. Nor does it say how most of the tens of billions of dollars raised from pollution permits would be spent, or whether the revenue would be returned to consumers to compensate for higher energy bills" (Broder 2009). Rather than clarifying allowance allocation early on, the details of percentage and exact emissions goals are left for the House of Representatives to determine in hearings. What *had* been created was built-in flexibility: "The Administrator shall modify the percentages set forth... as necessary to ensure..." successful emissions reductions (United States Congress, House, "Discussion Draft"). A strategic reserve had also been planned, so as to regulate the prices in this new carbon market. In an analysis of Congressional speech, Dr. Robert Shaffer states that "Like other human actors, politicians tend to avoid addressing issues that involve a heavy cognitive load... When legislators try to write laws with sufficient detail and precision to preclude administrative discretion, they quickly run up against their own cognitive limits: beyond a certain point, human beings just cannot anticipate all the contingencies that might arise" (Shaffer 90). It is easier, in other words, to simply write basic legislation and let the contingencies be dealt with by smaller, or simply different, organizations— like the EPA. The hearings were also an opportunity to collect expert advice and understand the various contingencies better. As a result, in the initial discussion draft,

the allowance allocation numbers were not yet available, but the flexibility was already built in. This lack of detail (although it would have been supplied shortly), became a huge talking point during the hearings.

Concessions were also a concern with the bill, with accusations of weak targets and too many free allowances. Obama had initially wanted to auction all allowances from the start, but over time, the bill shifted to the point that 85% of allowances were free (but used for specific, beneficial purposes). A quote in Eric Pooley's *The Climate War* reads,

“In addition to the weaker 2020 target and the free allowances and the generous offsets that would allow power companies to comply with the law while continuing to burn coal, Boucher [, a Democratic representative and a supporter of coal] demanded and Waxman agreed that the bill would give the industry \$1 billion a year for ten years for [carbon capture and sequestration] research and development, and set aside \$181 billion worth of bonus allowances to hand to utilities that began capturing and storing their carbon dioxide after 2020. And though any new coal-fired plant permitted after January 1, 2009, would have to cut its emissions in half by 2025, environmentalists were appalled that the bill exempted the six hundred existing coal-fired plants—which together generate half of all the electricity in the U.S.—as “well as new ones under construction, like Jim Rogers’s Cliffside, from the tough new standards” (Pooley ch. 9)

For some, these concessions were unacceptable; for others, they were a necessity to take a massive first step towards carbon emission reductions (Pooley ch. 9).

## Keywords that relate to allowance allocation:

### Percent

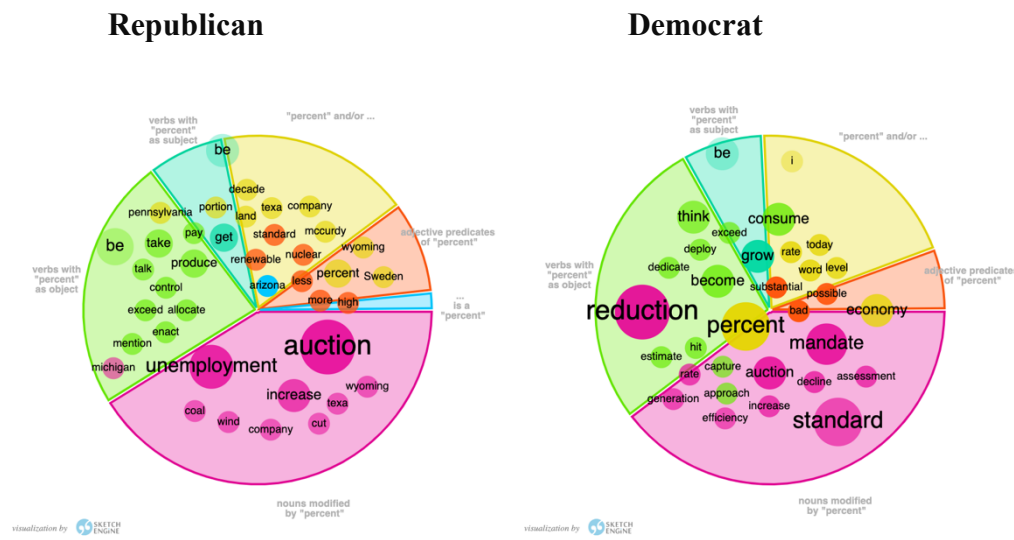


Figure 6: Collocates of “percent” in both corpora.

“Percent” occurs 103 times in the Republican corpus and 83 times in the Democrat corpus. Both corpora feature a variety of collocates.

“Percent” is a commonly used term in each corpus, with 103 uses in the Republican corpus and 83 in the Democrat corpus. In the Republican corpus, the most common collocate of percent is “auction,” with 10 uses, referring to allowance allocation and whether they will be auctioned or not. These ten uses are exclusively made up of representatives mentioning the idea of “100 percent auction,” which was President Obama’s original plan for a cap and trade program. “Allocate,” “portion,” and “percent” hearken to the same concept. With 6 uses, unemployment is the second most popular Republican collocate. All but one of these uses is, again, Congressman Walden emphasizing the need for woody biomass; he argues, here, that making use of National Forests would lower the unemployment rate in his district. His speech brings up an interesting example of a Republican arguing what is typically a Democratic argument. He approaches the topic with the idea of job growth, rather than arguing that the bill

will ultimately lead to more unemployment. The repetitive nature of his speech here, just as with woody biomass, indicates an aggressive tactic of badgering the witnesses with redundant questions about biomass to get his point across.

In the Democrat corpus, “percent” is most commonly used with the terms “reduction” and “standard,” as well as repetition of the word “percent” nearby. “Reduction” is the most common collocate, with 5 uses, typically referring to a reduction in carbon emissions, and once to the reduction of water availability as a result of climate change.

The frequent use of “percent” in both corpora returns back to the technoscientific approach that the discussion of cap and trade is led by. It is not an emotional, sociopolitical discussion; rather, it is led by standards, percentages, and measurable outcomes.

### **iii. International Concerns: Pros & Cons**

#### **a. Independence from Foreign Oil**

The U.S. history of dependence on foreign oil is vast. It began with the American fear of the idea that American oil would peak and decrease after a certain point; in 1920, that point was believed to be approximately a decade away. That information caused a shift in American oil policy, causing the U.S. to explore international oil in regions such as Latin America and the Middle East. Crises such as Egyptian nationalization of the Suez Canal and an oil embargo resulting from U.S. support of Israel in the Yom Kippur War of 1973 begin to show the faults in reliance on foreign oil, with Americans lining up for hours at the pump. What had initially been a solution to a national oil shortage became a cause of those same shortages, as a result of political turmoil. In response to national concerns, President Nixon announced “Project Independence,” advocating for energy conservation and investment in nuclear energy. Conservation measures,

often focused on fuel consumption, continued to develop with a varying sense of urgency over several decades, and the discomfort with foreign oil became ingrained in American politics (Council on Foreign Relations).

Concerns about foreign oil dependence have not been resolved today in 2022, let alone in 2009. As a result, alternative energy sources such as renewables are particularly relevant to this discussion, and—because these concerns are consistent and bipartisan—are a great selling point for ACES. The final bill includes the following text:

“(a) FINDINGS.—The Congress finds that— (1) the status of oil as a strategic commodity, which derives from its domination of the transportation sector, presents a clear and present danger to the United States; (2) in a prior era, when salt was a strategic commodity, salt mines conferred national power and wars were fought over the control of such mines; (3) technology, in the form of electricity and refrigeration, decisively ended salt’s monopoly of meat preservation and greatly reduced its strategic importance; (4) fuel competition and consumer choice would similarly serve to end oil’s monopoly in the transportation sector and strip oil of its strategic status; (5) the current closed fuel market has allowed a cartel of petroleum exporting countries to inflate fuel prices, effectively imposing a harmful tax on the economy of the United States; (6) much of the inflated petroleum revenues the oil cartel earns at the expense of the people of the United States are used for purposes antithetical to the interests of the United States and its allies” (United States Congress, House).

It is clear from this text that the 2009 Congress has a vested interest in moving away from foreign oil politically, even if they do not necessarily believe in doing so in response to climate change. This motivation could be one reason that cap and trade came up again and again in the early 2000s; although many Republicans were not certain that carbon emissions needed to be cut, they understood a different need for clean energy.

#### **b. International Industry Competition:**

Another major concern is American competitiveness in several industries, primarily focused on competition coming from China and India. This concern is rooted all the way back in the Kyoto Protocol in 1997, when the Senate unanimously passed the Byrd-Hagel resolution,

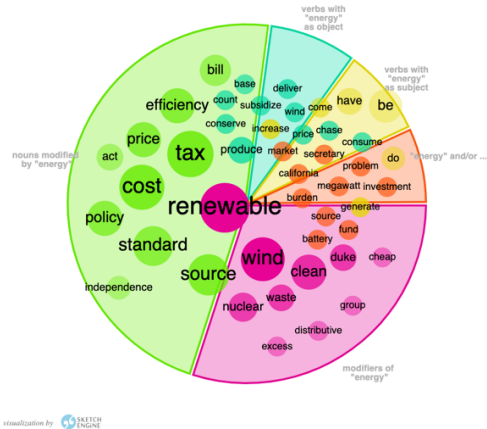


essentially stating that the U.S. should not sign any commitment to greenhouse gas emissions that did not also bind developing countries, such as China, to those same standards (S.Res.98). The common opinion was that the United States did not want to be a *leader* in this field; it wanted to make progress at the same rate as the rest of the international community. That concern is present in the bill, which requires the EPA to annually report whether China and India have adopted measures as strenuous as ACES. As mentioned in the allowances breakdown, ACES also allocates 15% of allowances towards energy-intensive industries that need protection from international competition. While international competition and protection of domestic companies is a shared concern, Republicans and Democrats also notably frame their discussions of China and India differently in the hearings. While Republicans choose to focus on the fact that China and India are not willing or able to cut emissions at the rate that the U.S. would need to with ACES, Democrats argue that America must be a leader in climate change solutions and encourage other nations to ultimately follow in its footsteps.



## Energy

### Republican



### Democrat

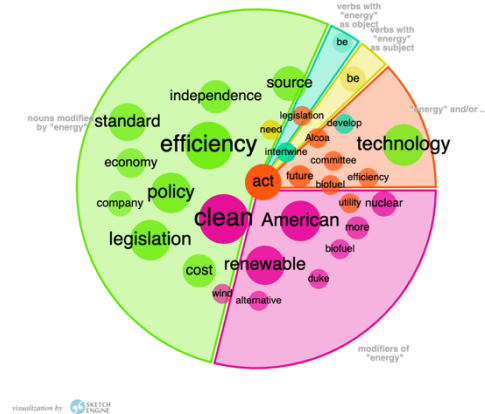


Figure 8: Collocates of “energy” in both corpora.

“Energy” occurs 293 times in the Democrat corpus, and 234 times in the Republican corpus. While “renewable” and “tax” are the most frequent collocates for “energy” in the Republican corpus, the Democrat corpus features collocates such as “clean” and “efficiency.”

“Energy” arises over 200 times in each party, but— as seen in the breakdown above— has varying collocates between the two. While for Democrats, it comes up most commonly with the words “clean” (20) and “efficiency” (19), for Republicans, it comes up most frequently with the terms “renewable” (18) and “tax” (15).

For Republicans, 5 mentions of “renewable” are mentioned in the context of “biomass”, with concerns about its definition in the bill. 5 additional mentions are in the context of the RES, primarily with concerns about the standard aiming too high. The remainder discuss various issues including nuclear energy, the question of job loss, concerns about insufficient technology/renewable energy to replace fossil fuels.

With the term “tax,” every occurrence labels cap and trade as a carbon tax, rather than a comprehensive market-based solution. For instance, “what has not been disputed is the fact that a

cap-and-trade energy tax will cost this country millions of good jobs...” and “you can see why many of us are concerned about this type of cap and trade energy tax...”

For Democrats, “energy” occurs with “clean” primarily with the title, American Clean Energy and Security Act, 9 times. The remaining 11 occurrences are primarily positive, advocating for the bill by mentioning useful technology, the potential for economic growth, with statements such as “Some have said that true energy reform will undermine our economy. They argue that there is a fundamental conflict between economic growth and clean energy. This is a false choice. Our economic future and clean energy are inextricably intertwined...”

Democrats also emphasize leadership around the term “energy,” while Republicans emphasize loss. Democrat representatives state, “In this way, clean energy will be the building block of a new era of American economic strength. With the American Clean Energy and Security Act, we will show the rest of the world that America is back and ready to lead again” and “[ACES] will help us win the race against China and other countries to establish leadership in clean energy technology.” Republican representatives, on the other hand, create the narrative that the U.S. should remain competitive over remaining a leader– “I don’t want to put the U.S. at a big disadvantage... with India and China.”

## Emission

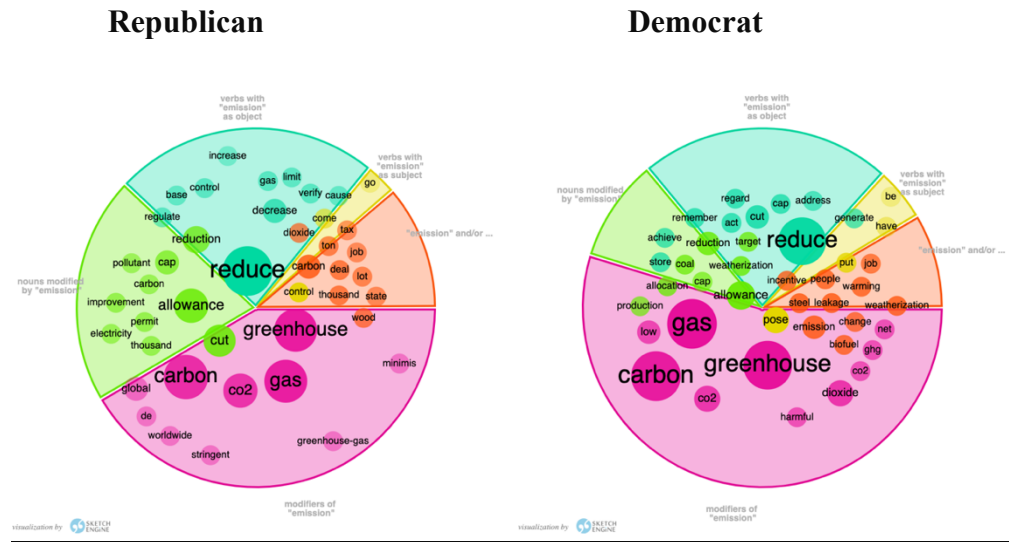


Figure 9: Collocates of "emission" in both corpora.

*"Emission" occurs 88 times in the Republican corpus, and 65 times in the Democrat corpus. It has a very broad group of collocates in both parties.*

Emission is a Republican keyword, but Republican and Democrat collocates are fairly in line with one another, with terms such as "reduce," "greenhouse," "carbon," and "gas" at the forefront. For Republicans, the majority of comments that include "reduce emissions" follow the following format: I believe that we must reduce emissions BUT not in this way. For instance, "I do believe we need to reduce emissions, but we must do it in a common sense way..." or in reference to nuclear energy, "Now, here is a power source that emits zero carbon dioxide. Why is this not a solution...?" Yet another comment follows: "For me, I do want to see emissions reduced. I want to see plenty of incentives to provide cleaner energy for all of our citizens, but I also want it to be fair, and I don't want to put the U.S. at a big disadvantage..." Some Republicans want a different solution entirely, without necessarily providing one. Other Republican representatives are more willing to develop the bill, such as Representative Burgess, who states, "We still have time to make changes to this bill, and I hope some of our witnesses

will offer suggestions, constructive suggestions, for how we can do this without further damaging the economy.”

Democrats also see room for growth in emissions reduction legislation, with comments such as “We must do all we can to ensure that the rest of the world works with us toward a goal of improving our environment and reducing carbon dioxide emissions,” but they simultaneously advocate for the bill as is. In an introductory speech, Representative Waxman states,

“The legislation we will be considering today has 4 titles. The clean energy title will spur investment in the technologies of the future, clean renewable energy, electric utilities, electric vehicles, and the smart grid. The energy efficiency title will reduce our dependence on foreign oil and save consumers billions of dollars by making our homes, our appliances, and our transportation system more energy efficient. The global warming title will create a market-based system for reducing carbon emissions to safe levels, and the final title will provide our industries, our workers and American families with the support they need during the transition to a clean energy economy. It is no longer a question whether we will act to reduce CO<sub>2</sub> emissions. The endangerment finding released by EPA last week answers that issue. The real question is whether we will do so in a way that strengthens our economy, creates new jobs, and ends our dangerous dependence on foreign oil.”

This statement, and others like it, indicates a level of confidence in the bill at hand, rather than a shallow acknowledgement of the issue without a deeper-rooted desire to fix it. This confidence and willingness to develop the bill into a more effective piece of legislation is present in both parties, but lacks in the comments of some Republican representatives.

## **VII. MAJOR CONCERNS SURROUNDING ACES, AS FOUND IN THE BILL**

The following issues are more clearly present after analysis of the text itself, rather than from background research. Thus, they are primarily made up of text analysis rather than background information.

### **i. Renewable Electricity Standard**

The RES is clearly a significant part of the conversation, playing a major role in the top 3 keywords of each party with the terms “electricity” and “renewable.” Interestingly enough, the RES appears more frequently in the Democrat corpus. Including searches for “RES” and the words “renewable” and “standard” near one another (in order to catch other names, such as renewable portfolio standard and renewable standard that refer to the same system), Republicans mention the RES 21 times, while Democrats mention it 41 times.

Republican mentions are primarily negative in nature. Those that are negative are surrounded by phrases such as “detrimental to the economy at a very bad time,” referencing the 2008 economic crisis. Republicans also refer to the RES as “a tax,” state that it would “cost [their] state over \$10 billion,” and frame it as a concern— when asking a question, Congressman Blunt stated, “I know Mr. Rogers, in his submitted testimony, raised the issue about the renewable electricity standards that were included and had concerns about those. Does anybody else share the concerns about the renewable standards?” He frames the standard as a problem (as opposed to an opportunity, or a neutral endeavor) immediately by using terms like “issue” and welcoming “concerns.” These concerns include the inclusion of nuclear energy; the word “nuclear” occurs in 9 of these 21 occurrences. 5 include the word “cost,” and 6 come from passages that also include the word “concern.”

Many Democrat mentions are also negative in nature. An impressive 18 of the 41 mentions include the word “concern,” 43.9% compared to Republican mentions of approximately 28.5%. 10 occurrences include “cost,” and 6 include “nuclear.”

## Keywords that relate to the RES:

### Renewable

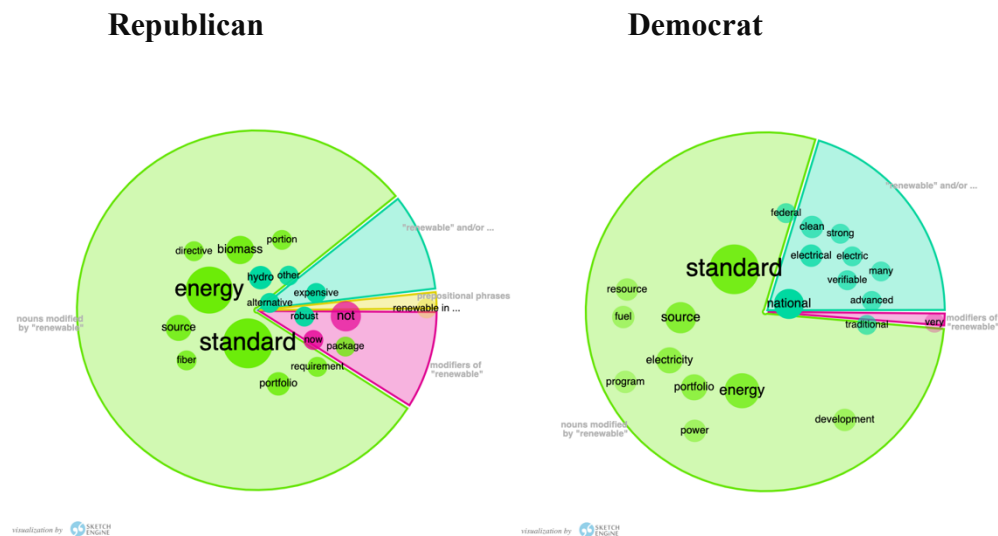


Figure 10: Collocates of “renewable” in both corpora.

*“Renewable” occurs 77 times as an adjective and 13 times as a noun in the Republican corpus, and 91 times as an adjective and 13 times as a noun in the Democrat corpus. The adjective collocates are pictured here, with references to the RES clearly dominating over other collocates.*

“Renewable” is a top 3 keyword for both parties, in both modes of evaluation. It is far more often used as an adjective than as a noun, and the most common words it is used with— in both parties— are standard and energy. The term standard is explained by the RES; the same can be said for terms like “mandate” or “directive.” Loosely, they refer to renewable energy programs required by the federal government. Collocates such as “portfolio” and “electricity” are also shared by both parties. A few interesting differences can be found with the Democratic words “traditional,” “verifiable,” “clean,” and the Republican words “expensive,” and “consider.” These collocates typically occur once or twice, as “renewable” primarily comes up with the RES, but their positive and negative connotations, respectively, provide insight to the leanings of each party. The Democrat collocates listed have positive connotations, selling the narrative that renewable energy is the best choice, while Republican collocates including





	Details	Left context	KWIC	Right context
1	doc#0	so point out that we know that we produce 51 percent of our	<b>electricity</b>	by coal, and in order to continue to do that, and also to help
2	doc#0	president has acknowledged that his plan will lead to higher	<b>electricity</b>	prices when he stated, quote, under my plan of a cap-and-tr
3	doc#0	he stated, quote, under my plan of a cap-and-trade system,	<b>electricity</b>	rates would necessarily skyrocket, unquote. according to the
4	doc#0	live compliance payments essentially amounting to a tax on	<b>electricity</b>	used by businesses and other consumers. this will drive up
5	doc#0	not on unrealistic federal mandates that selectively penalize	<b>electricity</b>	consumers in certain regions of our country. ultimately, it sho
6	doc#0	. we know that the renewable energy standard will increase	<b>electricity</b>	costs; there are ample case studies to prove it. we also know
7	doc#0	you to say that? ok. you have also stated that the american	<b>electricity</b>	prices are anonymously low and that coal is our worst night
8	doc#0	t coal-fired electric generation in order to provide affordable	<b>electricity</b>	for the american people? does that mean you would support
9	doc#0	this, but for people to propose that we are going to solve our	<b>electricity</b>	problems and stay competitive worldwide on wind and solar,
10	doc#0	ut electricity sources, it excludes renewable biomass as an	<b>electricity</b>	source. now renewable biomass is already defined early on

*Table 8: Random sample of 10 of 60 occurrences of “electricity” in the Republican corpus.*

*“Electricity” is often an issue of cost in this corpus.*

When evaluating a random sample showing 10 of 60 occurrences of “electricity” in the Republican corpus, it is clear that discussion of the term is concerned with electricity costs (see table 8). “Higher electricity prices,” “electricity rates would necessarily skyrocket,” “penalize electricity consumers,” are three such occurrences. This emphasis on increasing electricity costs also coincides with an argument for coal, with mentions of “support[ing] coal-fired electric generation” as well as an emphasis on “capture and storage technology” for coal use. 3 of these 10 occurrences contain the term “coal” in their context.

## Standard

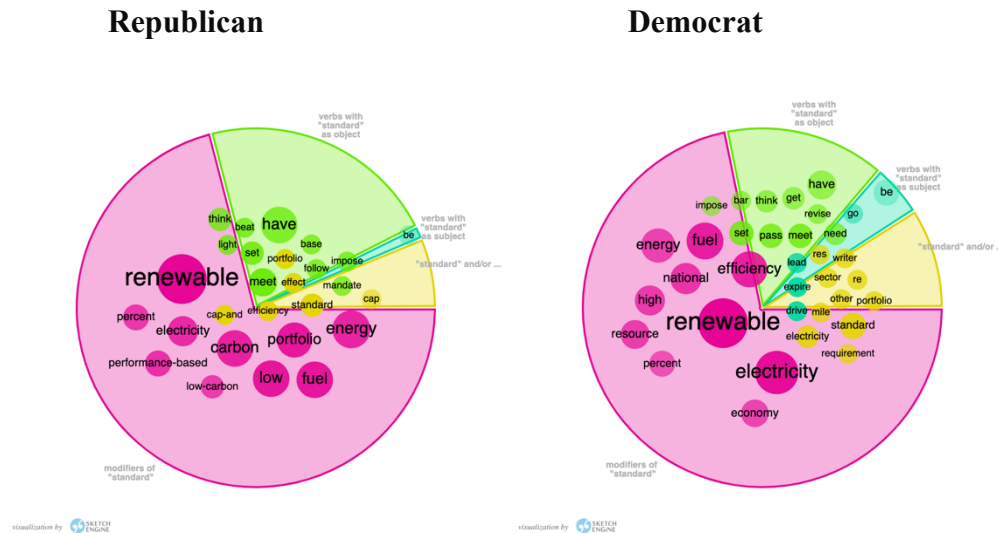


Figure 12: Collocates of “standard” in both corpora.

“Standard” is used primarily as a noun in both parties, with 62 noun occurrences and 2 adjective occurrences in the Republican corpus and 87 noun occurrences in the Democrat corpus.

Although it is a keyword only in the Democrat corpus, standard is used frequently by both parties, with 64 occurrences in the Republican corpus and 87 in the Democrat one. “Renewable” is a common collocate in both parties, along with “electricity” in the Democratic party. Like renewable and electricity, occurrences of the word “standard” are primarily in reference to the RES. However, the general frequency of the term “standard” does have some implications on how the cap and trade discussion is framed. Likely as a result of the legislative setting, the keywords show a more significant focus on the technoscientific discussion of climate change and cap and trade rather than a sociopolitical focus. The keyness of terms such as “technology,” “industry,” “percent,” and here, “standard,” implies that crafting effective regulation is the focus of the discussion, rather than any number of sociopolitical goals, such as convincing the public that climate change is a serious concern or ensuring that constituents are supportive of cap-and-trade style regulation. The impacts on constituents are always in the background of the discussion, when discussing energy prices and job losses, but they are

mentioned more as emotional arguments for or against the bill than they are as the center of the conversation, which is large-scale, technical change.

## ii. Technology

### Keywords that relate to technology:

#### Carbon

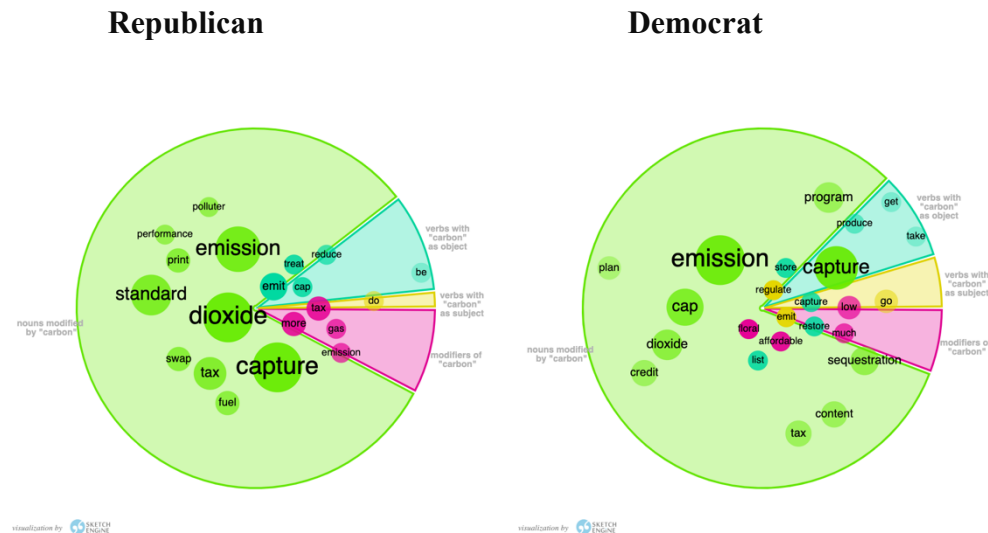


Figure 13: Collocates of “carbon” in both corpora.

“Carbon” is the number one keyword in both parties when evaluated with a smoothing parameter of 1, with 92 uses in the Republican corpus and 105 uses in the Democrat corpus. This indicates that “carbon” is a rare word in the 2005 corpus (with 0 occurrences) and is very common in the Democrat and Republican ACES corpora.

With the term “carbon,” the most commonly used collocates in both parties are typically “emission” and “capture.” Carbon capture is a major topic among both groups. When including the abbreviation, CCS, Democrats mention carbon capture 28 times, while Republicans bring them up 18 times. Both sides seem to be fond of carbon capture and sequestration, but unhappy with the current expectations of it in the bill; with Democrats, concerns arise about how long it will take to develop this technology: “Yet there are no commercial scale carbon capture and storage projects worldwide” ... “commercial deployment is not expected until 2025.”

Republicans have the same concern, calling the bill too aggressive and acting with “rose colored glasses” in this area. One Republican representative brings up the point that these types of technologies are developed through investment from the oil and gas sector, and therefore asserts that that “innovation” (and, implicitly, that sector) “should be nurtured and not stymied.” Otherwise, the same basic issues appear. Democrats attempt to sell carbon capture as “offer[ing] the promise of continued employment for... mine workers” and focus on its “job creation potential,” while Republicans bring to light the fact that “[India and China] certainly don’t have carbon capture and sequestration.”

A notable difference is the Republican words that are used most commonly that are not as common with Democrats. “Standard,” and “dioxide” are major words for Republicans, but not for Democrats. One of these terms highlights a key issue for a few representatives, which is the low carbon fuel standard, mentioned by multiple representatives a total of 8 times. A Low Carbon Fuel Standard (LCFS) implies that fuel would be included as one of the industries under ACES and would be given a maximum emissions standard, and several representatives are concerned about the impact of that on “prices at the pump.” For Democrats, this term arises only twice, once very briefly and once stating that representatives “have tried to tailor it in a careful fashion.” Ultimately, the low carbon fuel standard becomes a much less impactful “open fuel standard for transportation” (United States Congress, House, Discussion Draft; United States Congress, House).

## Technology

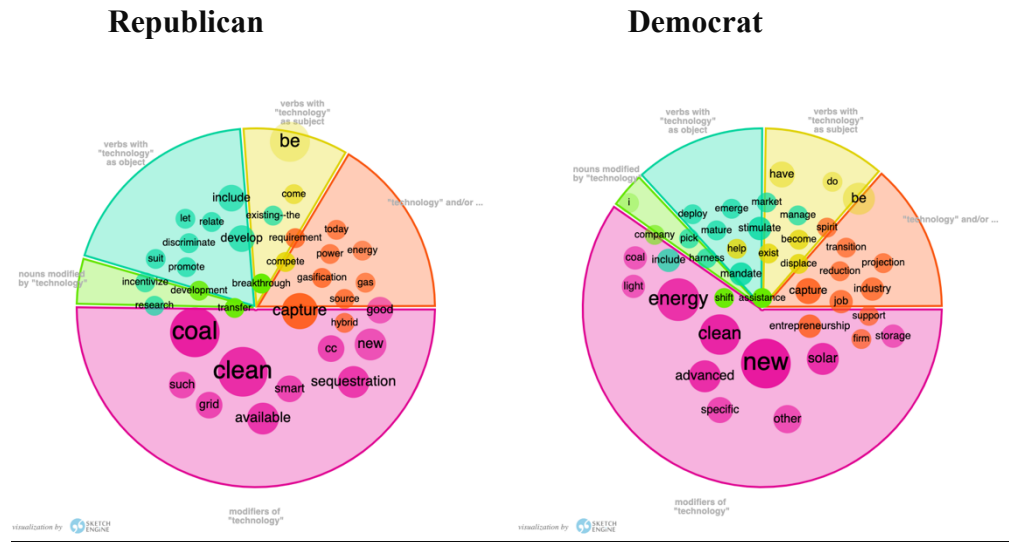


Figure 14: Collocates of “technology” in both corpora.

“Technology” occurs 45 times in the Republican corpus, compared to 120 occurrences in the Democrat corpus. However, the breadth of collocates remains wide for both, with Republican collocates such as “coal,” “clean,” and “capture,” and Democrat collocates such as “energy,” “clean,” and “new.”

As seen by the discussion of “energy,” the word “technology” is an important one, and often comes up when asserting that there either is or is not enough of it for ACES to move forward. In the Democratic party, the major collocates are “new,” “clean,” and “energy,” occurring 21, 12, and 14 times. For Republicans, “technology” most often occurs with “clean,” “coal,” and “capture,” occurring 8, 8, and 4 times. In total, technology comes up far more with Democrats than with Republicans, with a frequency of 120 for Democrats and only 45 for Republicans, making it a keyword only for Democrats.

The 21 occurrences of “technology” with “new” are particularly apt; this reveals the focus of Democratic messaging around technology. “Throughout these discussions, one of the things we are trying to do is really promote the creation of new technology. We have to have new technologies here, and even if we could do certain things at zero cost today that don't get us to the ultimate goal, we have to create these new technologies,” and “I also hope that we will

work with our Republican colleagues to produce a bill that produces the desired environmental results, spurs investments in new technologies and creates the new jobs that we desperately need. I believe entrepreneurs can find the technology to solve this problem better than any politician can” are a couple of examples of the 21 statements regarding novel technology in the Democratic party. The messaging is clear; the government must invest in new technology that will create new jobs and, simultaneously, slow climate change.

This collocate of “new” is contrasted by Republican collocates of “existing,” “available,” and “today,” occurring 1, 3, and 1 times respectively. The Republican corpus also indicates some sign of technological development, with terms such as “develop,” “promote,” and “new,” but they do so far less frequently than Democrats.

The terms “clean” and “energy” typically simply serve as descriptors of the new technology. “Clean” has a positive connotation, but is also a part of bill titles, including American *Clean* Energy and Security Act and the *Clean* Air Act.

## Solar

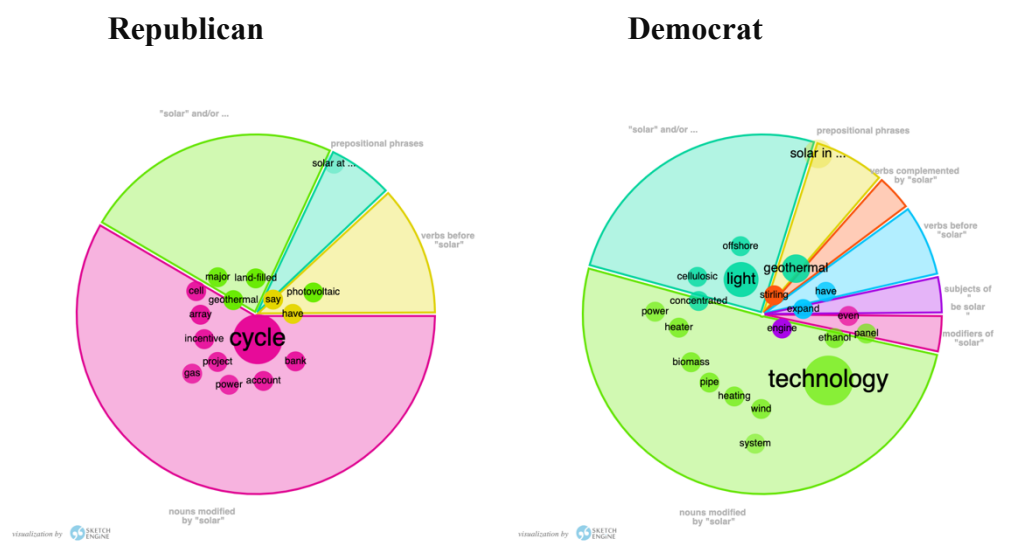


Figure 15: Collocates of “solar” in both corpora.

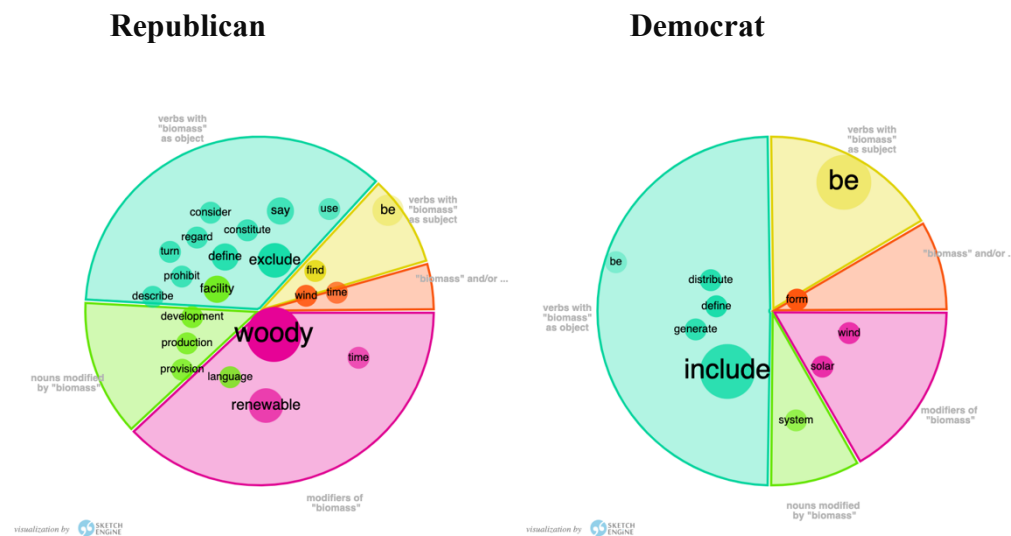
*“Solar” occurs 31 times in the Democrat corpus, and 26 times in the Republican corpus. It is used primarily to modify nouns in both parties.*

Use of the word “solar” is primarily concentrated around the word “technology” with 6 uses, as well as, with 2 and 3 uses, “geothermal” and “light” for Democrats. Republicans, on the other hand, do not refer to “solar” with the term “technology,” which is a reminder of the Democrat focus on investment in technology for this bill. The most frequent collocate for Republicans is “cycle,” with two uses, referencing potential alternative causes for global warming. However, the difference in number of mentions of “solar” between Democrats and Republicans (31 vs. 26) is not particularly significant.

### iii. Congressman Walden: Definitions of Biomass and Hydro

**Keywords that relate to the definitions of biomass and hydro:**

#### **Biomass**



*Figure 16: Collocates of “biomass” in both corpora.*

*“Biomass” occurs 44 times in the Republican corpus and 12 times in the Democrat corpus. Democratic mentions are positive or neutral, with terms such as “include,” and “generate,” while Republican mentions include “prohibit,” and “exclude,” as well as neutral terms such as “woody,” “define,” and “constitute,” which center around the definition of biomass.*



Biomass is a particularly Republican-based issue. Republican representatives—specifically, Congressman Walden from Oregon—are outraged about the definition of biomass in the original draft, which does not include the term “woody biomass.” Of the 44 occurrences, Congressman Walden uses the term “biomass” upwards of 20 times, stating that his district is highly forested, and requires the use of Federal forestland biomass as a source of renewable energy. The definition of biomass in the bill is ultimately changed to include “materials, pre-commercial thinnings, or removed invasive species from National Forest System land and public lands,” so long as the items used for biomass are sustainably harvested and do not put the ecosystem at risk (United States Congress, House). Despite his intense push for this change, which comes to fruition, Congressman Walden votes against the final bill. Congressman Walden’s aggressive approach shows clear opposition to the bill, focusing on small, easily altered definitions in order to undermine the much broader goals of the bill.

## Hydro

### Republican

modifiers of "hydro"	nouns modified by "hydro"	verbs with "hydro" as object	verbs with "hydro" as subject	"hydro" and/or ...	prepositional phrases
<b>new</b> new hydro 6 11.7 ... <b>in-stream</b> in-stream hydro 1 11.3 ... <b>number</b> number, hydro 1 11.1 ... <b>old</b> old hydro 1 10.8 ... <b>legislation</b> legislation hydro 1 10.8 ... <b>major</b> major hydro 1 10.7 ... <b>big</b> big hydro 1 9.8 ...	<b>i</b> hydro, i 1 8.2 ...	<b>believe</b> believe that hydro 2 12.3 ... <b>consider</b> hydro is not considered 1 11.1 ... <b>include</b> include new hydro 2 11.0 ... <b>use</b> use hydro 1 9.5 ... <b>do</b> do big hydro 1 8.7 ... <b>have</b> have in-stream hydro 2 8.0 ... <b>be</b> be major hydro 1 6.0 ...	<b>be</b> hydro is 2 7.0 ...	<b>hydro</b> to do big hydro or new hydro, you are 2 13.0 ... <b>number</b> number, hydro 1 12.0 ... <b>i</b> hydro, i 1 7.9 ...	<b>'hydro' as ...</b> 5.0% ...
verbs with particle "out" and "hydro" as object	modifiers of "hydro"	nouns modified by "hydro"	"hydro" and/or ...	verbs before "hydro"	
<b>rule</b> rule out new hydro 1 14.0 ...	<b>yet</b> yet hydro 1 12.0 ...	<b>system</b> the hydro system 5 11.5 ... <b>facility</b> hydro facility 1 11.2 ... <b>power</b> hydro power 1 10.1 ...	<b>renewable</b> renewable, and yet hydro 2 13.0 ...	<b>add</b> added hydro 1 14.0 ...	

## Democrat

modifiers of "hydro"	verbs with "hydro" as object	"hydro" and/or ...	nouns modified by "hydro"
<b>existing</b> 1 13.0 ... existing hydro	<b>exclude</b> 1 12.7 ... excluding hydro	<b>energy</b> 1 9.5 ... energy and existing hydro	<b>energy</b> 1 8.6 ... hydro energy

Table 9: Collocates of “hydro” in both corpora.

*Sketch Engine separated “hydro” uses into noun and adjective for both parties. As a result, all of the collocates are used here for a complete representation. The frequency of each collocate is listed to the right of the word, and the typicality score is listed to the right of the frequency. “Hydro” occurs 30 times in the Republican corpus, and 3 times in the Democrat corpus.*

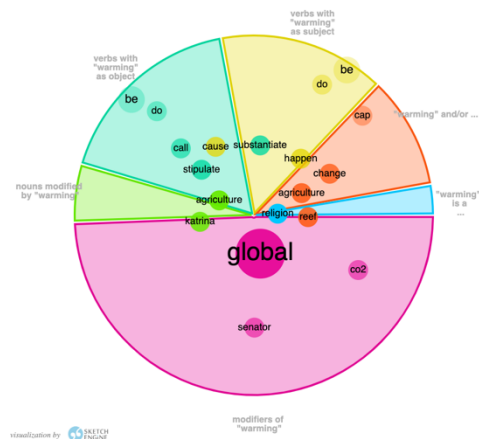
The issue of “hydro” in the Republican party is also dominated by Congressman Walden, enough so that it appears as a keyword for the party. “Hydro” appears 30 times in the text, and 17 of those occurrences are from Congressman Walden. He and one or two other representatives are displeased that the definition of qualified hydro power requires that “the hydroelectric project installed on the dam is operated so that the water surface elevation at any given location and time that would have occurred in the absence of the hydroelectric project is maintained...” (United States Congress, House, Discussion Draft). As of 2020, hydroelectric power accounts for approximately half of Oregon’s electricity generation, and it is likely this high potential for hydro power that pushed Congressman Walden to continuously linger on this issue (Energy Information Administration). The definition is not changed in the final draft of the bill.

#### iv. Belief (or Lack Thereof) in Climate Change/Global Warming

Keywords that relate to climate change skepticism or certainty:

##### Warming

##### Republican



##### Democrat

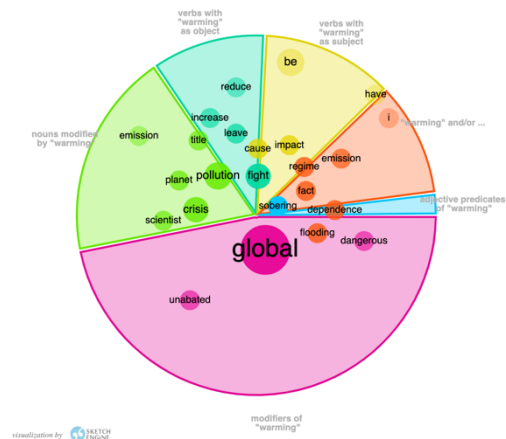


Figure 17: Collocates of “warming” in both corpora.

“Warming” occurs 21 times in the Republican corpus, and 31 times in the Democrat corpus. By far, the most common collocate is “warming” in both parties. Other collocates vary widely between parties.

“Warming” occurs 38 times in Democrat speech and serves as a keyword, but only occurs 21 times in Republican speech. By far, the most common collocate is “global” in both parties. For Democrats, reducing “global warming” is the object of the bill; 4 occurrences of the phrase contain the word “fight,” and 9 include the word “reduce.” 4 occurrences include “danger” and/or “threat” in their context as well. Various symptoms of global warming arise, too, including “flooding,” “disproportionate impacts on the poor,” and “increased drought, more frequent and intense heat waves and wildfires, and harm to water resources...” Democrats are clearly framing the bill as an opponent to global warming, while also framing global warming as a threat to humanity.

In Republican discussion of global warming, the word “fight” does not occur whatsoever, and “reduce” occurs once. “Danger” and “threat,” too, are lacking. Instead, 9 of 21 occurrences include references to “alarmism” or “alarmist” in their context. The messaging is largely focused on downplaying global warming’s impacts. One representative states that the testimony “did miss a few...” impacts of global warming, including the fact that “the Dallas Cowboys have not won a playoff game in ten years.” Another states directly that it is not “substantiated by the science.” On the other hand, one representative asks to “leave [global warming] aside” and “focus on security [and] focus on the economy” instead, deeming global warming a controversial issue that need not be the center of this bill. Thus, while there is some belief in global warming indicated in the Republican party’s speech, it is clear that global warming is not the reason that the majority of Republicans are willing to support this bill; if anything, it prevents them from doing so.

## CO<sub>2</sub>

### Democrat

modifiers of "co2"	nouns modified by "co2"	verbs with "co2" as object	verbs with "co2" as subject	"co2" and/or ...	prepositional phrases
<b>coal</b> coal co2 <b>more</b> more co2	<b>emission</b> co2 emission	<b>sequester</b> sequester coal co2 <b>emit</b> co2 emitted <b>send</b> sending more co2 <b>be</b> was that co2	<b>be</b> co2 was	<b>cost</b> co2 and the costs	... for "co2" 16.7% ... of "co2" 16.7%
<b>"co2" is a ...</b> pollutant co2 was not a pollutant	... is a "co2" time time was that co2				

nouns modified by "co2"	"co2" and/or ...	verbs before "co2"
<b>production</b> co2 production <b>capture</b> co2 capture <b>emission</b> co2 emissions	<b>net</b> net co2	<b>compress</b> compress co2 <b>sequester</b> sequester co2

## Republican

modifiers of "co2"	nouns modified by "co2"	verbs with "co2" as object	verbs with "co2" as subject	"co2" and/or ...	prepositional phrases
<b>manmade</b> 2 12.8 ... manmade co2 <b>elevated</b> 1 12.2 ... elevated co2 <b>case</b> 1 12.2 ... case co2 <b>dioxide</b> 1 11.8 ... dioxide , co2	<b>content</b> 1 13.4 ... co2 content <b>i</b> 1 8.2 ... co2 , i	<b>inhale</b> 1 12.7 ... inhaling co2 <b>regulate</b> 1 12.2 ... regulating co2 <b>include</b> 1 10.2 ... include co2 <b>think</b> 1 9.8 ... think co2	<b>meet</b> 1 12.7 ... co2 meet <b>be</b> 2 7.0 ... co2 is	<b>methane</b> 1 12.4 ... co2 or methane <b>temperature</b> 1 12.4 ... co2 and elevated temperatures <b>dioxide</b> 1 12.2 ... dioxide , co2 <b>i</b> 1 7.9 ... co2 , i	... of "co2" 37.5% ... "co2" as ... 8.3% ... "co2" in ... 4.2% ... "co2" to ... 4.2% ... ... to "co2" 4.2% ... ... than "co2" 4.2% ... "co2" under ... 4.2% ... ... since "co2" 4.2% ...
adjective predicates of "co2"	"co2" is a ...				
<b>hazardous</b> 1 14.0 ... co2 is hazardous	<b>pollutant</b> 1 12.7 ... co2 was a pollutant				

nouns modified by "co2"	"co2" and/or ...	verbs before "co2"
<b>concentration</b> 4 12.6 ... co2 concentrations <b>emission</b> 6 11.3 ... co2 emissions in the <b>enrichment</b> 1 10.8 ... co2 enrichment <b>pollution</b> 1 10.8 ... co2 pollution <b>science</b> 1 10.8 ... co2 science <b>level</b> 1 10.4 ... co2 levels <b>allowance</b> 1 9.8 ... co2 emissions allowances <b>warming</b> 1 9.8 ... co2 , global warming	<b>atmospheric</b> 1 12.7 ... atmospheric co2 <b>hydrospheric</b> 1 12.7 ... hydrospheric co2 <b>manmade</b> 1 12.7 ... manmade co2 <b>global</b> 1 12.2 ... co2 , global	<b>call</b> 1 13.4 ... called co2 <b>create</b> 1 13.0 ... creating co2

Table 10: Collocates of “CO<sub>2</sub>” in both corpora.

Sketch Engine separated “CO<sub>2</sub>” uses into noun and adjective for both parties. As a result, all of the collocates are used here for a complete representation. The frequency of each collocate is listed to the right of the word, and the typicality score is listed to the right of the frequency. “CO<sub>2</sub>” occurs 41 times in the Republican corpus, and 13 times in the Democrat corpus.

The most common collocate for both Democrats and Republicans around the term “CO<sub>2</sub>” is “emission,” and for Republicans, “concentration.” When both parties refer to “CO<sub>2</sub>,” they typically use it as an adjective for CO<sub>2</sub> emissions or concentrations, which is logical given that ACES revolves around tracking and minimizing CO<sub>2</sub> emissions. As a noun, “CO<sub>2</sub>”’s main Republican collocate is “manmade,” used twice by Congressman Barton from Texas. The context of one such use is below:

“You know, if [phenomena such as changes in ocean chemistry] are occurring, they are occurring, but to lay that at the feet of global warming is not substantiated by the science, and some of these alarmist predictions are just that. They are predictions. they will not be fact. Now, let us get to some things that are fact. We know that the United States each year creates **manmade CO<sub>2</sub>** emissions in the neighborhood of 7 billion metric tons, 7 billion. If you cost that **manmade CO<sub>2</sub>** at \$100 a ton, which most of the experts who have looked at the cap and trade system say that the tons cost is going to be between \$100 and \$200 billion, if you take the \$100 a ton number, that is \$700 billion a year...”

Here, the use of the term “manmade” emphasizes the idea that while CO<sub>2</sub> may be manmade, the effects of climate change are not. Other Republican comments around “CO<sub>2</sub>” are comparable, including use of the collocate “inhaling” as a part of the question, “Just what is the health hazard since CO<sub>2</sub> itself is not a pollutant? Inhaling CO<sub>2</sub>, being exposed to CO<sub>2</sub>, in and of itself is not a health hazard? You are creating CO<sub>2</sub> as you talk to me.” Interestingly, collocates that may appear to be on the side of climate certainty, such as “science” and “pollution” tend to appear in skeptical contexts, when coming from Republican speakers. A few additional comments are neutral or even positive as well, referring to emissions that are planned to be cut and even including terms like “constructive recommendation,” but these make up fewer than 25% of the 41 occurrences.

simple co2 • 13

261.13 per million tokens • 0.026%



	Details	Left context	KWIC	Right context
1	doc#0	at they intend to have an algae-based biodiesel biofuels, zero	co2	emission, up and running by 2011 at twice the levels that they
2	doc#0	f people have talked to coal--about the need to sequester coal	co2	. we have a technology at the ramgen company that leads the
3	doc#0	imgen company that leads the world in the ability to compress	co2	so we can bury it permanently and create jobs in this country.
4	doc#0	onomy. it is no longer a question whether we will act to reduce	co2	emissions. the endangerment finding released by epa last wee
5	doc#0	ran so kindly referred to, our assessment at that time was that	co2	was not a pollutant. in any event, you are now in this wonderfu
6	doc#0	? well, you are going to have to regulate everything in sight for	co2	production and i am asking you how many or i am asking you
7	doc#0	we would have as many as 106 regulations, perhaps more, on	co2	emissions because you would have to do it under the state im
8	doc#0	r, which are developing algae based biofuels which have 0 net	co2	emissions, the people at infinia in washington that have devel
9	doc#0	hellvue washington, which has developed a way to sequester	co2	so we maybe can use coal cleanly and create hundreds of job
10	doc#0	ese technologies, including those that offer very high levels of	co2	capture? first of all, the general observation is that we all belie
11	doc#0	it they are right now succeeding in capturing 90 percent of the	co2	emitted, but only doing this demonstration project on 1 percent
12	doc#0	rovisions of the bill will apply to researchers' transportation for	co2	and the costs associated with that. but--i know that is broad, b
13	doc#0	fuel, electrical generating plants had to be built, sending more	co2	up into the atmosphere. so, too, their delaying the improvemen

Table 11: Democrat usage of the term “CO<sub>2</sub>.”

The occurrences are sparing and without any consistent tone.

Democrat usage of “CO<sub>2</sub>,” is much more sparing, but it is mixed as well. Two positive comments mention the “crea[tion of] jobs in this country” or mentions of new, efficient sources of renewable energy, such as “algae-based biodiesel biofuels.” One comment still includes hints of negativity or skepticism, stating that “our assessment at that time was that CO<sub>2</sub> was not a pollutant,” referring to the 1990 Clean Air Act. However, three others take a negative tone towards CO<sub>2</sub>, indicating a desire to “bury” it, “mentioning that its emission “delay[s] the improvement in the fuel economy standards” and referencing an “endangerment finding” about the gas.

## Climate

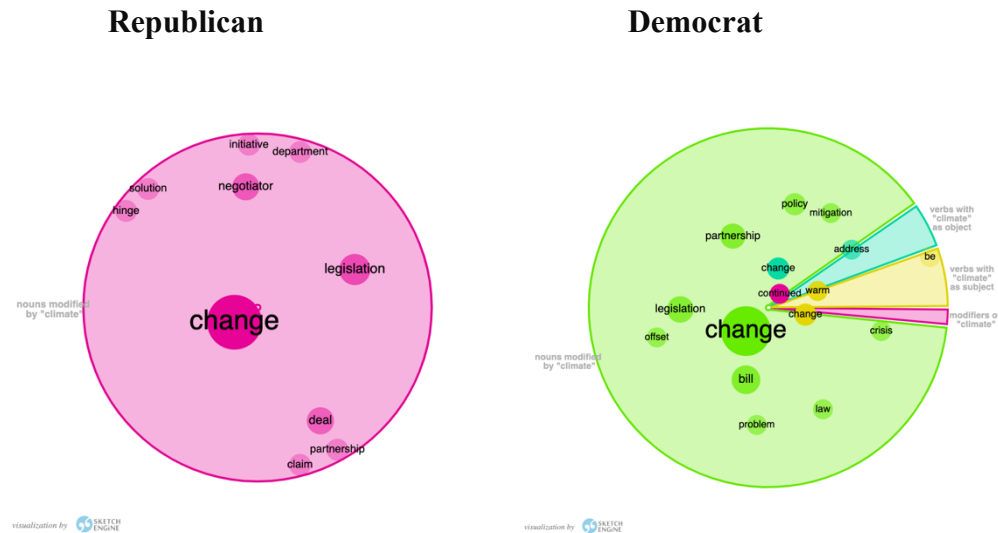


Figure 18: Collocates of “climate” in both corpora.

“Climate” occurs 31 times in the Republican corpus, and 78 times in the Democrat corpus. “Change” is the major collocate for both parties.

The primary use of the term “climate” is as a descriptor of “change” for both parties, but “climate change” occurs 44 times in Democrat speech while only occurring 13 times in Republican speech. In addition to the differences in frequency, the tones of the speech around “climate change” vary between parties. In the Republican party, there is a strong sense of uncertainty. “While climate change *may be* one of the most urgent problems facing our country,” “While the debate on the causes of climate change *may be far from settled*,” “I *don’t believe* that mankind is the primary cause of climate change,” are three such occurrences (italics added for emphasis). Other Republican uses of “climate change” do not question its scientific validity, referring to it as a “serious problem that necessitates serious solutions,” but still carry a negative tone, wondering how it can be curbed “without nuclear even being addressed” or with “Indian officials [saying] it was unlikely to prompt them to agree to binding emission cuts,” etc. In the Democrat speech, there is a much more settled, certain belief in climate change. “Climate change



is real. We need to do something about it,” “Climate change is one of the most serious issues facing the nation,” “We must acknowledge the science of climate,” “We now have a consensus that climate change is real, it is urgent, and we have to address it,” are all examples of Democrat references to climate change. There is not only a certainty around the Democrat representatives’ belief in climate change, but there is an implication that climate change is scientific fact and has been decided, highlighted by terms such as “science” and “consensus.” For many Democrat representatives, there is no longer a question, in 2009, of whether climate change is man-made or not, while for Republicans, that question is very much still in play.

Democrats also bring up the threats of climate change, including “temperature increases,” “serious and unpredictable risk for... constituents,” and “the amount of loss to our GDB due to drought.”

Interestingly, similarly to the term “warming,” both parties have members stating that the debate of man-made climate change is not relevant to the discussion at hand. In the Republican party, Representative Burgess from Texas states, “Dr. Apt, who was with us yesterday, and he said it so eloquently, that we have to focus on reducing carbon dioxide, rather than trying to pick winners and losers in this. If we will focus on what is the reasonable thing to do, whether we want to focus on security, whether we want to focus on the economy, or we can spend a lot more time arguing about the science of climate change.” In the Democratic party, Representative Melancon from Louisiana states, “Some choose to debate whether the cause of climate change is man-made or a result of natural cycles. To be frank, the cause does not matter. We have all seen the impact of change in climate on our land and our oceans.” These bipartisan arguments have the potential to push the discussion away from the hopelessness of political gridlock, but there are not enough of them made for a significant step to be taken away from the climate change

argument. Ultimately, the fact that “warming” and “climate” occur on the top 10 lists of the Democratic party implies that the anthropogenic climate change debate continues to lurk in the background of this bill. Neither term occurs in the top 10 of the Republican party, potentially implying that Democrats are more likely to emphasize climate change and global warming to prove the bill’s importance, while Republicans– primarily opposing the bill– frame the discussion around other issues.

## v. Unclassified Keywords

### Greenhouse

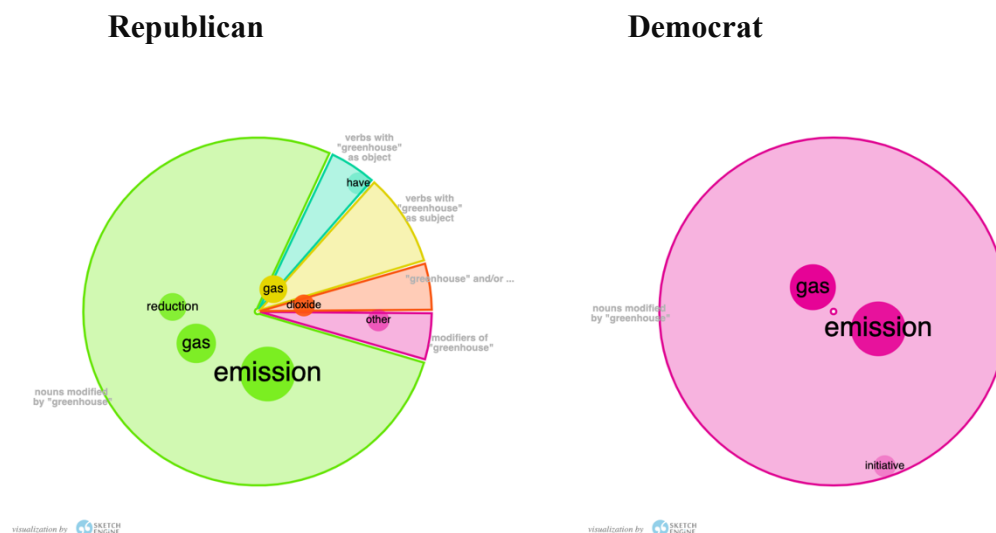
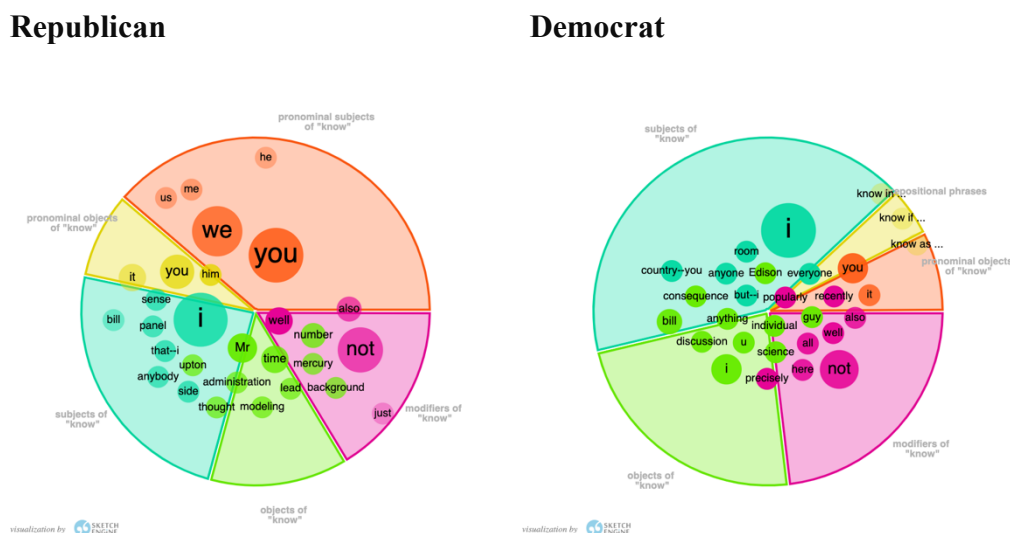


Figure 19: Collocates of “greenhouse” in both corpora.

“Greenhouse” occurs 20 times in the Republican corpus, and 32 times in the Democrat corpus. In the Democrat corpus, it is used exclusively with the terms “gas” and “emission,” while the Republican corpus focuses on the same terms but also includes “reduction,” “dioxide,” etc.

Greenhouse occurs in both parties most commonly with the phrase “greenhouse gas emission.” It has 20 occurrences in the Republican corpus and 32 in the Democrat corpus. The collocates are not particularly telling, but the KWIC provides more information. 17 (53.1%) of occurrences in the Democrat corpus include the term “reduce” in their context, while 2 (11.8%) of the Republican occurrences include it. The synonym “decrease” occurs 3 times in the

Republican corpus as well, making for a total of 25%. “Health” occurs 9 (28%) times in context of “greenhouse” in the Democrat corpus, and not at all in the Republican corpus. Instead, there are 4 (23%) mentions of India, and 8 (47%) mentions of “greenhouse” have “nuclear” mentioned in their context. This implies that while Democrats are focused on the large-scale, moral narrative of reducing greenhouse gasses in order to increase public health, Republicans are continuously bringing up issues with the execution, some controllable (nuclear power) and some largely out of Congress’ control (international response).




*“Know” occurs 134 times in the Republican corpus and 83 times in the Democrat corpus. Pronouns such as “I,” “you,” “we,” “know,” are common in both corpora.*

and the audience, as a simple conversation habit, or as a way of emphasizing a point, when beginning a comment with “as you know.” “I know,” similarly, appears as a turn of phrase with little significance. The next most common collocate, “not,” allows for some uncertainty. “Don’t know” or “didn’t know” occur 9 times in the Democrat corpus, and 17 times in the Republican one.

## Republican

simple not know • 17  
383.91 per million tokens • 0.038%



	Details	Left context	KWIC	Right context
1	doc#0 s off is not included in the draft of this bill. similarly, we can		not know	the true cost of this bill until the permit issue has been dec
2	doc#0 j him--"necessarily skyrocket," for consumers. what we do		n't know	, what we must know before this bill becomes law, is what
3	doc#0 t china discovered 180 miles of the great wall that they did		n't know	existed. how on earth are they going to be able to monitor
4	doc#0 u comment on what we need to improve the program? i do		n't know	, is that a final resolution? during your confirmation, i was f
5	doc#0 rt of the criteria. i thought this was a softball question. i did		n't know	it was difficult. ok. i appreciate that. dr. chu, real quick, this
6	doc#0 11:00 the night before a 10:00 markup in which you all do		n't know	whether you will be incentivized or harmed and it will get re
7	doc#0 sparent process in a hearing on the bill, yes or no? you do		n't know	what to know? so would it be helpful to have a hearing on t
8	doc#0 ow would be wto amenable, but again, the jury is out. i do		n't know	whether that is going to work or not. i have a feeling, mr. cl
9	doc#0 ear. i live in texas, and we have fossil fuels there, and i do		n't know	how we are going to do away with fossil fuels. of course, w
10	doc#0 hinese official said yesterday."</s><s>that was li gao, i do		n't know	if that is the right pronunciation, but that is the way it looks
11	doc#0 teelworkers, i believe they are supportive of that. well, i do		n't know	. it would be great if you could go back to them, because th
12	doc#0 er, lake michigan, though i don't, maybe mr. manning, i do		n't know	whether you support it off nantucket or not. do you? you do
13	doc#0 t. now, they provide, if we end up going to 25 percent, i do		n't know	what the wind component of that will be. i would guess wh
14	doc#0 uld be strongly bipartisan as we embark on that issue. i do		n't know	if you saw last week's washington post, but there was a he
15	doc#0 nt's desk, legal challenges probably taking years will start,		not knowing	how many jobs will depart, as it relates to wto. as it impact
16	doc#0 i because of manmade co2, i think are debatable, and i do		n't know	about this scientific peer review that you just talked about,
17	doc#0 it this planet is going to fry in 30 years. this congress does		n't know	what is going to happen in a week, let alone 30, 40 years.

Table 12: KWIC of “not know” in the Republican corpus.

*These occurrences are more common than in the Democrat corpus and indicate a sense of uncertainty around the bill as well as climate change.*

## Democrat

<div> <div>simple not know • 9</div> <div>180.78 per million tokens • 0.018%</div> <div></div> </div>			
Details	Left context	KWIC	Right context
1	doc#0 ist lead the way. we cannot wait until the recession ends. i do	n't know	when that is going to be, but we must begin this debate this v
2	doc#0 we are going to mark up in our subcommittee next week, i do	n't know	if we can get those specifics to you because some of those d
3	doc#0 vehicle, before you turn that over, is about 11 years. and i do	n't know	when you put all of these figures together where we are going
4	doc#0 nt in the methodist house with congressman cooper. and i do	n't know	if you left anything behind, but we will check. our nation's sec
5	doc#0 n money they want. i don't disagree with those ideas, but i do	n't know	how you do it without spending some money, and quite frankl
6	doc#0 n the room that were here when we did the clean air act. i do	n't know	if you--you certainly weren't here in 1970. you were here in 19
7	doc#0 . work with us, and if you don't think it is a problem, then i do	n't know	why you are even giving us those six or seven solutions, beca
8	doc#0 and then just step back the way we did after 1996 and we do	n't know	who the winners and losers are going to be. we don't know if
9	doc#0 on't know who the winners and losers are going to be. we do	n't know	if there is going to be a nynex or a bell atlantic or a bell south

Table 13: KWIC of “not know” in the Democrat corpus.

There are 9 occurrences here, for comparison with the Republican corpus.

In the Democrat KWIC of “not know,” there are expressions of doubt regarding when the recession will end (as a way to emphasize that the bill is urgent and cannot be delayed infinitely), uncertainty about exactly which companies will rise to the top after the bill’s implementation, and uncertainty about certain details of the bill as a result of its in-progress state. Typically, these comments are either neutral or intended in support of the bill. In the Republican corpus, “not know” occurs 17 times, and several occurrences are used to emphasize a lack of detail in the bill or a lack of certainty regarding climate change. Some occurrences are neutral, such as “I don’t know what the wind component of that will be. I would guess...” or “I don’t know whether you support it off Nantucket or not.” Others are used to undermine the bill’s purpose, such as “this Congress doesn’t know what is going to happen in a week, let alone 30, 40 years,” and one representative who indicates that “China discovered 180 miles of the Great Wall they didn’t know existed,” and thus cannot ever be trusted to “monitor and reduce their greenhouse gas

emissions,” implying that ACES will never be worthwhile because China will not be able to put in place comparable regulation.

## Electric

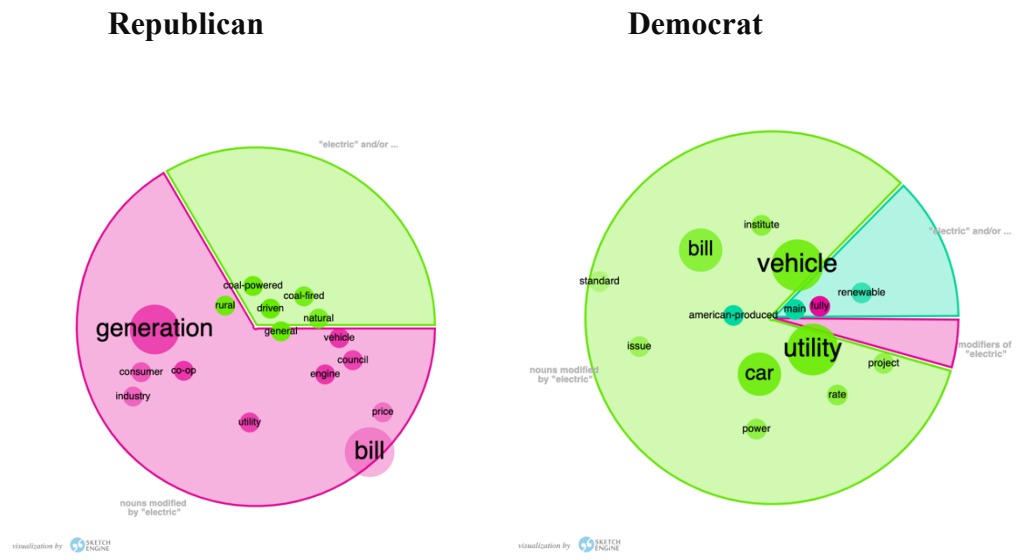


Figure 21: Collocates of “electric” in both corpora.

“Electric” occurs 12 times in the Republican corpus, and 21 times in the Democrat corpus.

“Electric” and “electricity” are both common words in the Democrat corpus. In Democrat speech, electric is typically used to refer to transportation (“vehicle,” “car”) and “utilit[ies].” In the Republican corpus, “electric” occurs so infrequently that its most common words are not particularly significant; for example, “bill” and “generation” are most commonly used, but each only has 2 occurrences.

## US/us

The term “us” occurs 160 times in the Democrat corpus and 95 times in the Republican corpus. The program was unable to generate visuals for this term. The term is used in order to create a sense of community and personalize each side’s argument, similarly to the term “our.” Otherwise, it does not hold much significance.

## CONCLUSION

### i. Opposing Ideological Frameworks

This study found that three major opposing ideological frameworks occurred between the Democratic and Republican parties. First, with terms such as “cost,” and “electricity,” a divide between the bill as an investment versus as an unnecessary, harmful cost is clear. Where Democrats focus on reducing costs around the bill and ensuring that consumers of electricity do not bear the ultimate burden for the bill, Republicans emphasize that the cost is too massive to overcome. Republicans frame the discussion as a choice between climate progress and the economy and choose the economy. Democrats refuse that framing altogether.

A similar disagreement occurs around the idea of leadership as opposed to the maintenance of the status quo. With terms such as “industry” and “energy,” Democrats imagine a world in which Americans lead the international community in climate action, while Republicans fear that America’s climate action will cause its industries to lag behind those of other nations without carbon emissions regulations. The same framework appears around the term “technology,” where Democrats focus on future development while Republicans emphasize current insufficiency.

Finally, certainty as opposed to skepticism around anthropogenic climate change appear several times throughout the bill, centered around terms such as “warming,” “CO<sub>2</sub>,” “know,” and “climate.” Democrats tend to treat anthropogenic climate change as a known fact, while Republicans avoid expressing certainty about it, when mentioned. While some Republicans simply do not discuss the idea of anthropogenic climate change, others outright deny the science behind it.

Other notable findings include that while keywords were primarily technoscientific in nature, with terms such as “percent,” “standard,” and “technology,” sociopolitical arguments did

occur in the KWIC analysis, with comments about impacts to “consumer[s]” or “constituent[s],” pursuing a solution that is “fair, equitable, and right,” and the possibility or loss of “good” jobs. Because these terms are not keywords, the results of this study are consistent with the findings of “Taming the Climate”; as is to be expected in a bill that aims to develop a carbon market, the majority of the terminology used is technoscientific rather than sociopolitical (Willis 225).

These findings indicate that, outside of generally more negative, disapproving speech from Republicans and more positive, ambitious speech from Democrats around ACES, the two parties frame the major issues of the bill in drastically different ways. Without agreeing on a basic ideological framework— perhaps one of international risk-taking and leadership, one in which climate policy can support economic growth, or simply a certainty about anthropogenic climate change— they will not reach a bipartisan solution. If these frameworks continue to be points of contention, then new, compelling ones must be developed to replace them. A quote from Representative Burgess represents the best path forward:

“[We always] come down to arguing about, did global warming cause Katrina? Did global warming cause the death of a polar bear? And there are going to be arguments on both sides.

**Why not just leave that aside? Why not focus on the security? Why not focus on the economy? Why do we have to be in a position of picking winners and losers?”<sup>3</sup>**

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<sup>3</sup> Bold added for emphasis.



## ii. Future Directions

Since the failure of ACES, the Regional Greenhouse Gas Initiative, passed in 2009 and currently including Connecticut, Maine, Maryland, Massachusetts, New York, New Hampshire, New Jersey, Rhode Island, and Vermont, has reduced both CO<sub>2</sub> and SO<sub>2</sub> emissions in the region; as of September 2021, according to its own reporting, “RGGI emissions have reduced by more than 50%— twice as fast as the nation as a whole— and raised over \$4 billion to invest into local communities” (Chan and Morrow 1; Regional Greenhouse Gas Initiative 1). Similarly, in 2020, California Cap-and-Trade reached a 100% compliance rate for the 2018-2020 period (Young). Notably, leakage, or an increase of emissions in other states as a result of decreased emissions in one state, has been a problem in both systems (Caron et al. 1; Chan and Morrow 1). Further analysis is necessary to evaluate the successes of these programs, but they do provide a strong starting point for a national emissions trading system. On a national level, however, the chances of a cap and trade program developing remain slim; on June 30<sup>th</sup>, 2022, in *West Virginia v. EPA*, a majority-conservative Supreme Court ruled against the EPA’s ability to single-handedly regulate carbon emissions in the power sector, requiring action to be taken by Congress before such regulation can take place (Liptak).

This thesis is a successful proof of concept, showing that corpus analysis can be used to analyze the ideological framings of American political debates. Although the most significant points of contention around a political issue may be found in newspapers or reports, corpus analysis reveals the specific framings of the decision makers (Willis 214). In the future, similar approaches can be applied to discussions of different topics, or discussions of similar topics by different speakers. For instance, it may be helpful to analyze Supreme Court argument transcripts on cases related to carbon emissions and climate change, such as *West Virginia v. EPA*. As the

makeup of the Supreme Court is more consistent than Congress, a larger body of text could be accumulated from the same speakers. As the Supreme Court is structurally non-partisan, this study would not necessarily be split by political party but may still reveal ideological leanings.

With the minimal amounts of corpus analysis research on climate-related speech of politicians, however, there are many other directions in which this research could proceed, as well. Rhetoric around the two current North American carbon emissions trading systems, the Regional Greenhouse Gas Initiative and the California Cap-and-Trade program, could be compared to determine which ideological framings pushed those programs into law. Rhetoric around other types of bills, such as RES or carbon tax bills, could be compared to an ACES corpus to determine whether the ratio between technoscientific and socioeconomic framing changes depending on the bill in question. In developing ideological frameworks around renewable energy that are inclusive and bipartisan rather than contentious, corpus analysis of rhetoric from Republican states which have established an RES in the past could be beneficial. Evaluating larger bodies of text about ACES, should they become available, would allow for a larger and more accurate sample size as well.

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