

Article

The Oil and Gas Discourse from the Perspective of the Canadian and Albertan Governments, Non-Governmental Organizations and the Oil and Gas Industry

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Abstract: Three of the major players in the discussion of the production of oil and gas are: (1) government; (2) the oil and gas industry and (3) non-governmental organizations (NGOs). A comparison of contributions from these three sources using a list of positive and negative words from the General Inquirer Category Listings showed that industry provided a very positive message about the production and consumption of oil and gas that is generally reinforced by government whereas NGOs advocated for a reduction in the use of oil and gas. Messages delivered by each player are focused on the same topics in either a positive or negative way and are often contradictory. The authors submit to be properly informed the public must consider all the sources in order to avoid bias. A mind map is presented in a supplementary file which summarizes information from each source in a comprehensive way. This approach can be used by consumers when considering the choice of using oil and gas and can be extended to the discourse beyond Canada.

Keywords: oil and gas discourse; consumer; NGO; government; industry; General Inquirer Category Listings

1. Introduction

The production and use of oil and gas has become a hot topic in North America and elsewhere with growing concern over its impact on climate change and sustainable development [1,2]. Major contributors to the discussion on this topic include: (1) government; (2) industry and (3) non-governmental organizations (NGOs). All three contribute greatly to the overall discourse offering a variety of written and televised information to the public [1,3,4] in an effort to influence the extent to which consumers want to use oil and gas *versus* alternative energy sources, such as electricity from non-fossil fuel sources including hydroelectric, nuclear, wind, solar and tidal as well as biomass based fuels [5,6].

To make properly informed energy choices consumers must be able to compare and contrast the information provided by various sources in a critical manner. Analyzing texts for positive/negative tone offers an approach that can identify positive and negative perspectives [7,8] regardless of the argument being presented. For example one previous study used the Harvard IV-4 dictionary to identify any changes in tone in management documents [7]. Another developed an automated method of analyzing the tone of news coverage during Dutch elections in 2006 [9]. The study presented here used General Inquirer Category Listings, which is a combination of the Harvard IV-4 dictionary and the Lasswell value dictionary, to conduct a key-word based analysis. When combined with an in depth analysis of the context of the text, this provided a strong method for understanding tone [8]. This paper presents the results of a key-word based analysis of the discourse around oil and gas using documents from the Canadian and Albertan government, the oil and gas industry, and NGOs involved in oil and gas policy discussion. The approach used in this study could also be applied to the discourse on hydrocarbon energy production taking place elsewhere [10–16].

2. Methods

2.1. Data Collection

Reports were collected including progress reports and research reports available for free on the websites of two NGOs (the Pembina Institute and the Dirty Oil Sands network); four oil and gas industry organizations [the Canadian Association of Petroleum Producers (CAPP), Canadian Natural Resources Limited (CNRL), the Canadian Oil Sands Trust, and the Mining Association of Canada (CAM)] and government (Provincial Government of Alberta, the Government of Canada) as well as government linked regulatory bodies (Energy Resources Conservation Board and the National Energy Board). Fact sheets, pamphlets and articles were excluded.

The two NGOs were chosen because they are two of the most vocal advocacy NGOs involved in the oil and gas debate in Canada. There are other NGOs that provide information but are not involved in advocacy work, such as the Canadian Geographic Society and the Canadian Institute of Chemistry. All the reports of the Pembina Institute are written by employees. The Dirty Oil Sands network provides reports from various environmental NGOs including Green Peace and the National Resource Defence Council. All relevant reports identified by searching the website of both NGO's for reports on oil and coal bed methane were downloaded.

The industry sources were chosen because they encompass the main information for both oil and gas production from an industry perspective. All relevant reports identified by searching the website of the industry sources for reports on oil and coal bed methane were downloaded.

The government sources chosen provided perspective from a main oil producing province and from a national level, as well as from the government bodies in charge of overseeing energy production. All relevant reports were downloaded from the “Data Library” of the government of Alberta website on Environment and Sustainable Resource Development. From the government of Canada, relevant reports were downloaded from the Aboriginal Affairs and Northern Development section of their website. Relevant reports from the Energy Resources Conservation Board were downloaded from the “Report Series” section of the Alberta Energy Regulator website. From the National Energy Board website, relevant reports were downloaded from the Annual Reports section of the site as well as from the Oil Sands and Natural Gas sections.

2.2. Data Analysis

All reports were downloaded from their respective websites as PDF files and then uploaded into ATLAS.ti[®], a qualitative data analysis software (CAQDAS) [17,18]. Each file was given a filename and the three types of reports (NGO, industry, government) were categorized into separate “families” within the one single hermeneutic unit. In order to develop an understanding of the positive and negative aspects of oil and gas discussed by these sources, a list of positive and negative words was used, found in the General Inquirer Category Listings (containing 11,788 words), which combines the Harvard IV-4 dictionary and the Lasswell value dictionary [19]. For the purpose of the research and the coding, 107 words were chosen from the initial General Inquirer Category Listings based on potential relevance to the oil and gas discourse. Of these 107 words, $n = 30$ were categorized as positive, $n = 31$ as negative, and $n = 46$ were other words which did not have a positive or negative classification. The auto-coding tool of ATLAS.ti[®] was used to code for the 107 positive and negative terms from the General Inquirer Category Listings highlighting all the sentences which use a given code, producing a list of “quotes”. After the auto-coding process was complete, the quotes from each code were read and the context was documented.

Categorization of Codes

Once the contextual analysis was complete, the codes were classified as positive, negative or both based on the findings. These results were mapped in table form and using Freemind 1.0.0, a mind mapping software, displaying the codes in both Positive and Negative categories and then adding the context in which the codes appear as either positive or negative, or neither. The mind maps are available as supplementary files as a PDF and as the original mind map one can open with the software FreeMind [20].

2.3. Limitations

Not every possible source of information from any of the perspectives was used. The purpose of this paper is to provide an overview of the general discourse, thus the sources were chosen based on

their relevance and dominant presence in the oil and gas sector. This may introduce bias, as the most vocal NGOs are the NGOs which adamantly oppose the production of oil and gas, and the oil and gas industry sources used are the advocates for the production of oil and gas. Therefore, this paper presents strongest views on the production of oil and gas, which do not represent the full spectrum of perspectives. The use of only the Albertan and Canadian government is also a more narrow perspective, as other provinces and territories may offer a different view on the production of oil and gas. Alberta provides one example of a province involved in oil and gas production, and the government of Canada is the national body. Another limitation is the use of only 107 of the 11,788 keywords from the General Inquirer Category Listings. Although both authors agreed on the choice of keywords used, it is possible that different or more words may have been selected by others. The choice of words still provides data on the tone of the oil and gas coverage however if all of the keywords were chosen more themes would have been found.

3. Results

3.1. Main Focus of the Reporting by the Three Sources

A comparison of contributions from these three sources using a list of positive and negative words from the General Inquirer Category Listings showed that industry provided a very positive message about the production and consumption of oil and gas that is generally reinforced by government whereas NGOs advocated for a reduction in the use of oil and gas.

The NGO reports emphasize the damage industry causes the environment, for example “Air quality problems are increasing around the oil sands” [21], as well as criticizing industry in general, such as doubting industry’s ability to provide jobs ($n = 11$).

“Long term” is in reference to the environmental impacts in the long term. “Risk” is often associated with the risk that industry is causing, such as in [22]. The NGO reports use the word “security” to suggest that energy security is not enhanced or improved by industry; the reports strive for more efficiency rather than greater supply, using energy security as an argument [22] (examples in Table 1).

As for industry reports many of the words are used positively in the discussion about the growth of production. For example: “accelerate” production ($n = 13$; 50%); “achieve growth” ($n = 17$; 9%); and “afford” more production ($n = 6$; 86%). According to the industry reports, the economy will benefit greatly from expanding production. The industry reports did not use the word “dependency”, it appeared only in NGO ($n = 15$) and government reports ($n = 4$). “Dependency” was referring to decreasing dependency on oil.

The government reports are often in line with the industry reports (see Mind Map supplemental file), supporting development and encouraging industry to grow and expand; for example, the word “accelerate” is related to accelerating development and the word “enhance” is related to enhancing recovery and exploration ($n = 26$) (examples in Table 2).

Table 1. Keywords discussing damage caused by industry in non-governmental organization (NGO) reports (n = numbers of hits). GHG: green house gases.

Long term ($n = 118$)	<p>“In the short term, those rights to pollute will be jealously guarded by industry sectors and their supporters in government, even though the transition to a green economy is inevitable over the long term.” [23]</p> <p>Long term environmental damage ($n = 10$)</p> <p>“The market maximizes short term profits while sacrificing long term quality jobs for Albertans and Canadians” [24]</p>
Risk ($n = 648$)	<p>Oil spill ($n = 45$)</p> <p>Risk assessment ($n = 22$)</p> <p>GHG ($n = 4$)</p> <p>Environmental ($n = 23$)</p> <p>“Species at risk” ($n = 34$)</p> <p>Posed by tailings seepage ($n = 32$)</p> <p>Human health ($n = 17$)</p> <p>Posed by oil sands development ($n = 38$)</p> <p>“Firstly, they are high-risk in terms of their structural implications, that is, they embody and illustrate the drive to access previously inaccessible or uneconomic resources and will further deplete our remaining carbon budget and exacerbate energy insecurity. Secondly they also risk (further) damaging vulnerable communities and ecologies” [22]</p> <p>“Despite the existing pollution and the high risk of more pollution to come, Canadian energy policy increasingly revolves around the oil sands” [25].</p>
Security ($n = 586$)	<p>Energy security ($n = 166$): e.g., “Tar sands do not enhance energy security simply because they come from a friendly neighbor” [26]; “There is greater recognition that seeking to maximize supply alone cannot guarantee energy security and that improving energy efficiency must be part of the solution” [22]; “Reducing Europe’s structural dependence on increasingly costly fossil fuels is thus essential for our future energy security” [27]</p> <p>Water security ($n = 5$)</p> <p>Financial security ($n = 39$)</p> <p>National security ($n = 24$)</p> <p>Security deposits for reclamation ($n = 27$): e.g., “large land-disturbing industries (e.g., oil sands mines) were not providing security at full cost of reclamation and that there was no model in place to determine what a sufficient amount of security other than full cost might be” [28].</p>

The government reports also discuss the “need” for leadership ($n = 7$) and clearly defined roles ($n = 6$). As well, the government acknowledges the importance of sustainable development, and balancing production with protecting the environment, such as: “achieve an appropriate degree of conservation of solution gas and environmental protection” [29]. The majority of the text in the government reports is factual reporting of events, such as interactions between oil and gas companies and the National Energy Board and developing policies, plans and standards. Along the same lines, the reports discuss assessments and measurements of aspects of production including “performance” (performance measures/measurement $n = 34$), “risk” (risk assessment $n = 16$)—in fact, during the research process the phrase “risk management” was mentioned so frequently that the authors developed a new code for it. The government reports the positive impacts of production on the economy, and discusses the economy triple the amount compared to industry.

Table 2. Keywords supporting oil and gas production in the government reports. GDP: gross domestic product.

Accelerate (<i>n</i> = 25)	Development of the oil sands (<i>n</i> = 14): e.g., “Accelerate the development of the oil sands while ensuring a fair return to the resource owners—Albertans” [30]; “that accelerate the pace of development in conventional and/or oil sands resource” [31].
Enhance (<i>n</i> = 203)	Shareholder value (<i>n</i> = 4) Competitiveness (<i>n</i> = 8) Resource recovery (<i>n</i> = 3) Resource exploration (<i>n</i> = 12)
Growth (<i>n</i> = 1186)	Majority of hits are encouraging oil sands growth: e.g., “A major goal of this Ministry is the sustaining of growth opportunities in the energy and mineral resource sectors through the development of responses to environmental concerns, particularly climate change” [32]; “Alberta’s GDP growth exceeded Canada’s as a whole” [29]; “Energy development has shaped Alberta’s history, communities and growth, and it stands to play an important role in Alberta’s future” [33] Few hits concerned about oil sands growth: e.g., “There are also negative socio-economic effects associated with this rapid growth” [34]; “Thus, the continued growth of oil sands direct GHG emissions will create a major challenge for Alberta and Canada to meet Canada’s international commitments for reducing overall GHG emissions” [35] Many hits related to: “Higher commodity prices, slightly lower economic growth rates, and efficiency improvements result in lower transportation energy demand in the future” [36]

3.2. The Use of Language

Of the 107 word of the General Inquirer Category Listings selected as relevant *n* = 30 were categorized as positive and *n* = 31 as negative. In the government documents *n* = 26 words categorized as negative and *n* = 30 categorized as positive were found. The numbers were *n* = 18 and *n* = 25 for the industry sources, and *n* = 26 and *n* = 30 for the NGO sources, for words categorized as negative and positive respectively. However being categorized as positive or negative within the General Inquirer Category Listings did not mean that a word was used as classified; some words were used in a certain tone which did not have any categorization in the General Inquirer Category Listings. The following sections show how words were really used by the three sources.

3.2.1. Same Use by All Sources

Various words from the general inquiry list were used in the same manner, both in context and in tone, throughout all of three of the sources. These codes and context are as follows (*n* = the number of hits; proportion of sources code is found in): “accelerate” development (*n* = 36; 38%); “achieve” emissions reductions (*n* = 51; 7%); “adapt” to climate change (*n* = 10; 20%); depleting supplies of “easy” oil (*n* = 17; 13%); energy “efficiency” (*n* = 488; 44%); economically “feasible” (*n* = 33; 26%); technically “feasible” (*n* = 31; 24%); “limit” emissions (*n* = 64; 15%); “maximize” economic benefits (*n* = 22; 7%); “minimize” environmental damage (*n* = 64; 17%); “quality” of life (*n* = 48; 2%), air “quality” (*n* = 277; 13%) and water “quality” (*n* = 72; 4%); “unsafe” work (*n* = 4; 33%); and finally,

“waste” management ($n = 192$; 18%). However, there is also a difference in how language is used between the sources.

3.2.2. Words Categorized as Positive or Negative Used in the Opposite Way

Various words categorized as positive or negative according to the General Inquirer Category Listings were not used in such fashion. In the NGO reports various words were used in a negative context ($n = 30$), of which ($n = 5$) were classified as positive in the General Inquirer Category Listings; (examples in Table 3 and Mind Map in supplemental file).

Table 3. Words used in a negative tone in NGO reports.

Potential ($n = 1067$)	Job creation, questioning industries ability to create jobs: e.g., “Conclusion: employment potential from KXL is little to none” [37] Green jobs ($n = 6$) Threat to health ($n = 27$) Impacts on the ecosystem ($n = 275$)
Value ($n = 645$)	“We love and value the west coast of British Columbia for its creativity, innovation, quality of life and unparalleled natural beauty” [38] \$ value of oil and projects ($n = 238$) Value added ($n = 82$)

In contrast to the NGO reports, which used positive words in a negative tone, the industry reports put a positive spin on words ($n = 45$), some of which were categorized as negative according to the General Inquirer Category Listings ($n = 8$; examples in Table 4). For example, the industry reports use the word “conflict” in the context of conflict resolution and management.

Table 4. Words used in a positive tone in industry reports.

Cost ($n = 1947$)	Transportation costs ($n = 34$) Productions costs, factors of production ($n = 617$) Capital cost ($n = 89$) Low cost ($n = 21$) Cost control ($n = 29$) “cost effective exploitation in defined core areas” [39]
Harmful ($n = 4$)	Mitigating harm ($n = 3$) Converting harmful emissions to benign emissions [40]
Hazard ($n = 13$)	Hazard management ($n = 10$)
Problem ($n = 10$)	Problem solving ($n = 3$)
Uneconomical ($n = 1$)	Tapping into new reserves which were previously uneconomical [41]
Conflict ($n = 64$)	Conflict resolution/management ($n = 4$)

Similar to industry, the government reports put a positive spin on most of the words used ($n = 45$), from which ($n = 11$) were categorized as negative and ($n = 28$) were categorized as positive. For example, akin to industry, the word “conflict” ($n = 29$) is used ($n = 12$) to discuss conflict management.

3.2.3. Different Discussion Using Same the Word

3.2.3.1. Same Word, Different Tone

Some words which do not have obvious positive or negative sentiments were used differently depending on the source. In the same way that NGOs used negative discussion of positive words, NGOs also discussed the negative aspects of the same words which were discussed in a positive way by industry and the government ($n = 19$; examples in Table 4 and Mind Map supplemental file). For example, “air quality” was discussed within the context of the already damaged air caused by the harmful emissions produced by the oil sands, whereas in the industry and government reports the discussion around air quality is focused on the actions being taken to improve air quality. Similarly, “health” was seen as something being damaged by production from the NGO perspective whereas “health” in the industry and government reports was related to protecting and monitoring health. Moreover, NGO reports refer to the negative impact industry may have on the economy, based on environmental damage and dependency on a non-renewable resource, whereas industry and government refer to the positive impacts, such as Gross Domestic Product (GDP) growth. “Wealth” is used in a very similar way, in which the NGO reports discuss negative impacts of oil wealth and uneven distribution of oil wealth. There is also a significant contrast in the word “potential”; the NGOs focus on negative potentials, such as ‘potential’ threats to health and the environment, compared to the industry and government which focus on positive potentials such as “potential” growth for the industry and “resource potential”. Finally, according to the NGOs, we “need” to manage water, protect the environment and shift away from using oil and gas; according to industry, we “need” to focus on aspects which will allow for continued growth and production.

Some words which are considered negative were found to be used in positive ways in the industry and sometimes government reports ($n = 4$; examples in Table 5 and Mind Map supplemental file). “Hazard”, which is typically a negative word, is used to discuss safety hazard management in the industry reports and hazard assessments in the government reports, creating a positive tone; “hazard” in the NGO reports follows the typical negative tone, and is referring to toxic hazards and health hazards. In a very similar way, industry puts a positive spin on the word “problem” by discussing “problem solving” whereas NGOs only discuss problems, such as tailings pond leakage and oil sands emissions.

The government discusses problems such as fracking leakage and solutions to the problems, such as collaboration and scientific improvements. A third example is the word “uneconomical”, which is negative in the NGO and government reports, referring to open pit mining and imports and exports, respectively, however industry discusses tapping into reserves which were previously uneconomical.

Table 5. Keywords with negative tone in NGO reports and positive tone in industry and government reports.

Keywords	NGO reports	Industry reports	Government reports
Air quality (<i>n</i> = 277)	Negative tone <i>n</i> = 191 “Air quality is starting to be impacted by oilsands air pollution.” [42] Concern for air quality Blaming poor air quality on oil sands “Air quality problems are increasing around the oil sands” [21] Air quality assessments Manage air quality	Positive tone <i>n</i> = 48 Manage air quality Monitor air quality	Positive tone <i>n</i> = 38 Air quality assessments Manage air quality Improve air quality
Health (<i>n</i> = 1755)	Negative tone <i>n</i> = 646 Negative impact of industry on human health Costs to public health Health of ecosystems, environmental health	Positive tone <i>n</i> = 566 Protecting health and safety Human health Fish health Economic health Ecosystem health	Positive tone <i>n</i> = 543 Health and safety Health care Health and Wellness Ministry “Natural gas has always been an important commodity in the economic health of the province” [43] “Monitoring of health impacts should be undertaken on both health outcomes and health determinants” [35] Ecosystem health Human health Occupational safety and health
Economy (<i>n</i> = 1381)	Negative tone <i>n</i> = 801 “Many Canadians believe that, given the role oil plays in our economy, we must make a choice between environmental protection and economic growth.” [25] Title of an article: How Dirty and Expensive Oil from Canada Threatens America’s New Energy Economy [26] Dependency on revenue from the oil sands is risky for the economy (<i>n</i> = 4) Green economy is stimulating growth (<i>n</i> = 2) [24,37] Oil sands impact on the environment which impacts the economy (<i>n</i> = 6): e.g., “Any such environmental reviews should consider the potential of tar sands oil spills, and the impact such spills might have on the environment and the economy” [44]	Positive tone <i>n</i> = 141 “The rise of the NWT diamond industry has been a boon to the northern economy and to northerner’s prosperity and well-being” [45] “As Canada focuses on a still fragile recovery, the mining sector shines as a powerful growth engine for Canada’s economy and an important source of well-paying jobs for hundreds of thousands of Canadians.” [46]	Positive tone <i>n</i> = 439 “Providing information for Albertans on the positive impact oil and gas industry has on the economy “Representing a quarter of the total investment in the province, Alberta’s energy sector remains a solid foundation for the province’s healthy economy and a source of tremendous value for Albertans.” [47] Surveying Albertans knowledge on the positive impact oil and gas industry has on the economy (<i>n</i> = 9) Providing information for Albertans on the positive impact oil and gas industry has on the economy (<i>n</i> = 2) “Albertans knowledge on the positive impact oil and gas industry has on the economy” [48] Diversify, strengthen the Northern economy (<i>n</i> = 16)

Table 5. Cont.

Keywords	NGO reports	Industry reports	Government reports
Wealth (<i>n</i> = 154)	Negative tone <i>n</i> = 72 Negative impacts of oil wealth: e.g., “The current fiscal policy provides the oil industry and its shareholders with an inequitable share of the wealth derived from oil sands exploitation.” [49] Wealth for future generations	Positive tone <i>n</i> = 22 Positive impacts of wealth from oil production	Positive tone <i>n</i> = 60 Positive impacts of wealth from oil production “Albertans are the beneficiaries of this province’s wealth of energy and mineral resources.” [47] Wealth creation through funding energy projects
Potential (<i>n</i> = 3426)	Negative tone <i>n</i> = 1067 Questioning industries ability to create jobs: e.g., “Conclusion: employment potential from KXL is little to none” [37] Threat to health Costs of environmental damage Impacts, risks for the ecosystem (from an oil spill)	Positive tone <i>n</i> = 695 “finding potential efficiencies in current technologies, the company is improving its performance while promoting energy research and development.” [40] Recovery Growth Liability	Positive tone <i>n</i> = 1664 “There is also significant potential to improve the recovery of existing conventional resources remaining in the ground through technologies such as CO ₂ injection.” [43] Resource Hydrocarbon Recovery Renewable energy CBM, shale gas
Need (<i>n</i> = 1507)	Negative tone <i>n</i> = 743 “It’s clear that we need to transition from fossil fuels to lowcarbon clean energy to make the emissions reductions needed to tackle climate change.” [25] For responsible water management, water conservation “oil prices need to remain consistently high for decades in order for projects to earn a return.” [26] To transition away from oil, reduce our dependence on oil For GHG emissions reductions For collaboration, agreement For planning, policy, regulations	Positive tone <i>n</i> = 209 For additional capacity (in transportation) (in extraction) “need for a renewed focus on skills development, and a need for enhanced support of the sector’s technological innovation.” [50] Multiple hits: “Canadian Natural recognizes the need for a strong financial position in order to withstand volatile oil and natural gas commodity prices and the operational risks inherent in the oil and natural gas business environment.” [51]	Positive tone <i>n</i> = 555 For additional capacity (in transportation) (in extraction) “There was a need to stimulate long-range exploration for natural gas that was considered marginally economical.” [52] “the need for increasing diversification of Alberta’s energy resource portfolio to meet future energy demands.” [32] and similar quotes For leadership For clearly defined roles For public understanding, support To prepare for oil spills Address needs of First Nations Assess need For stakeholder engagement

Other words were used in identical phrasing, with completely different tones (*n* = 15; examples in Table 6 and Mind Map supplemental file). “Exploit”, often in the phrase “exploit oil deposits”, is used in NGO reports in a negative way to be a synonym for abuse while industry and government are maintaining a positive tone using the word “exploit” to mean utilize. “Justify” actions is used in a positive way by industry, but has a negative tone in the NGO reports.

Table 6. Negative keywords with a positive spin in industry and government reports.

Keywords	NGO reports	Industry reports	Government reports
Hazard (<i>n</i> = 39)	Negative tone <i>n</i> = 16 Health hazard Toxic hazard	Positive tone <i>n</i> = 13 Safety hazard management	Positive tone <i>n</i> = 10 Assessment of work place safety hazards
Problem (<i>n</i> = 286)	Negative tone <i>n</i> = 204 “Petroleum is a problem.” [26] Tailings pond leakage Oil sands emissions Use of fresh water	Positive tone <i>n</i> = 10 Problem solving	Positive tone <i>n</i> = 72 Identifying the problem: fracking, leakage Identifying solutions: collaboration, science
Uneconomical (<i>n</i> = 9)	Negative tone <i>n</i> = 4 Drive demand for oil down so it becomes uneconomical Open pit mining	Positive tone <i>n</i> = 1 Tapping into new reserves which were previously uneconomical	Negative tone <i>n</i> = 4 Imports, exports

The word “growth” has a range of results throughout the sources. “Growth” is used in NGO reports negatively, slandering “growth of the tar sands” while industry discusses “growth of the oil sands” in a positive way; in this case, the government reports offer discussion for both sides of the argument, discussing both the possible harm of rapid growth and also encouraging further growth. The NGO reports also discuss “growth” in a positive way, encouraging sustainable growth. All of the sources discuss the potential impacts on economic growth (Table 7 and Mind Map supplemental file).

Table 7. Keywords used in identical context with a negative tone in the NGO reports and a positive tone in the industry and government reports.

Keywords	NGO reports	Industry reports	Government reports
Exploit (<i>n</i> = 63)	Negative tone <i>n</i> = 29 Tar sands (un)conventional oil	Positive tone <i>n</i> = 21 Multiple hits: “These new producer wells will effectively exploit this additional potential and could increase the recoverable resources from the field”	Positive tone <i>n</i> = 13 “Projects in other areas included research to provide the mining industry with better information to help it find and exploit new deposits” [48]
Justify (<i>n</i> = 45)	Negative tone <i>n</i> = 24 Justify new investments Justify expansion Justify costs	Positive tone <i>n</i> = 8 Justifying actions Justify future actions	Positive tone <i>n</i> = 13 Justify expansion Justify actions

3.2.3.2. Same Word, Same Tone, Different Topics

There are several examples of words which were used in the expected tone but which discussed different aspects of oil and gas (*n* = 15; examples in Tables 8 and 9 and Mind Map supplemental file). Firstly, “avoid” was used in the industry reports to discuss avoiding losing money, whereas the government reports discussed avoiding problems during extraction and environmental damage and the NGO reports focused on avoiding climate change and other negative environmental impacts. “Control” over costs and operations were discussed by industry and government, while “control” over water, waste, climate, and pollution was discussed in the NGO reports. Operating, capital,

and production “expense” was discussed by industry and government, while the NGOs focused on the “expense” to climate security. Finally, “control”, “expense” and “sustain” were referring to production, growth and operations in the industry and government reports, and was referring to livelihoods, ecosystems and biodiversity in the NGO reports; the industry reports also discussed sustaining employment and employee satisfaction.

Table 8. Keyword “Growth” in all the reports.

Keywords	NGO reports	Industry reports	Government reports
Growth (<i>n</i> = 2915)	<i>n</i> = 775 Production growth: e.g., “growth of tar sands production” [53] Sustainable growth “Lost Growth if Further Pipeline Capacity Cancelled” [54] Emissions growth GDP growth “China leading demand growth” [22] “The Alberta government’s overriding focus is on maximizing economic growth, under the assumption that if it gets this right, everything else will fall into place.” [55] Economic growth: e.g., “The Alberta government’s overriding focus is on maximizing economic growth, under the assumption that if it gets this right, everything else will fall into place.” [43] Smart growth	<i>n</i> = 954 Oil industry’s contribution to economic growth Population growth Industry is “a major factor in generating growth and prosperity in the province and transforming much of the structure and character of the economy.” [56] Production growth Growth of the industry Multiple hits ‘defined growth strategy’ Profitable growth “It is important for our stakeholders and the public to know how industry is contributing to economic growth, employment creation, environmental solutions and technology initiatives.” [57]	<i>n</i> = 1186 Majority of hits are encouraging oil sands growth: e.g., “A major goal of this Ministry is the sustaining of growth opportunities in the energy and mineral resource sectors through the development of responses to environmental concerns, particularly climate change.” [32]; “Alberta’s GDP growth exceeded Canada’s as a whole” [29]; “Energy development has shaped Alberta’s history, communities and growth, and it stands to play an important role in Alberta’s future” [33] Few hits concerned about oil sands growth: e.g., “There are also negative socio-economic effects associated with this rapid growth.” [34]; “Thus, the continued growth of oil sands direct GHG emissions will create a major challenge for Alberta and Canada to meet Canada’s international commitments for reducing overall GHG emissions.” [35]

The word “want” had a few interesting results in the NGO and government reports. The government reported that it is important to give Albertans what they want, and in several reports it was mentioned that what Albertans want is to have more environmentally friendly production. This was reiterated in the NGO reports, in which one report specifically stated “Albertans want polluters to pay cleanup costs” [58].

Table 9. Keywords with the same tone used in different contexts.

Keywords	NGO reports	Industry reports	Government reports
Avoid (<i>n</i> = 264) Negative tone	<i>n</i> = 164 Environmental damage Costs for environmental damage Climate change Contaminating water	<i>n</i> = 38 Losing money	<i>n</i> = 62 Problems during extraction and production Environmental damage
Control (<i>n</i> = 1085) Positive tone	<i>n</i> = 154 Water control regulations Waste control regulations Keeping climate in control Control pollution, GHG emissions Control over oil, resources	<i>n</i> = 649 Cost control “Control over production costs” Code co-occurrence: costs & control = 90 occurrences Operational control Transportation “control over financial reporting” Internal control	<i>n</i> = 282 Internal control Control over wells, production Quality control
Expense (<i>n</i> = 3271) Negative tone	<i>n</i> = 40 “The tar sands battle is about profit at the expense of climate security” [26] “Special treatment for the tar sands is still on the table, at the expense of other industry sectors and regions of Canada.” [59] “European oil companies have invested in the tar sands to extend their lifespans as oil companies, at the expense of the global atmosphere.” [60]	<i>n</i> = 2775 Administration expense Interest expense Production expense Tax expense	<i>n</i> = 456 “Revenue and expense” Operating expense Capital expense Amortization expense Pension expense
Sustain (<i>n</i> = 185) Positive tone	<i>n</i> = 35 Costs of synthetic fuel Livelihoods Ecosystems, watersheds, biodiversity	<i>n</i> = 73 Production, industry Operations	<i>n</i> = 77 Growth Employment, employee satisfaction two hits: sustain biofuel [61,62]

3.3. Direct Contradiction

There is a direct contradiction between industry and NGO in the use of the word “evidence”. While the NGO reports are referring to evidence of environmental damage and species degradation caused by the oil sands and mining, industry claims that “Current evidence on water quality impacts on the Athabasca River system suggest that oil sands development activities are not a current threat to

aquatic ecosystem viability” (cited from The Royal Society of Canada, see [63]). Industry claims that there is not enough evidence to prove any environmental damage and uses this as justification to continue to expand. NGOs claim that there is “ample evidence of leaking tailings ponds” [64] and other environmental damage, and use this argue that development must be slowed or stopped completely. The government reports reiterate what the industry reports suggest: “Current evidence on water quality impacts on the Athabasca River system suggests that oil sands development activities are not a current threat to aquatic ecosystem viability” [35].

4. Discussion

It is critical for consumers to understand the information being presented in the oil and gas discourse in order to make informed decisions when it comes to using oil and gas. This section discusses the implications of the content found in analyzed documents for consumers and how it may influence a consumer’s decision.

4.1. Universal Finding: Furthering Development and Protecting the Environment

Most of the words that were used in the same manner throughout the sources were related to either continuing development of the oil and gas industry or concern for the environment being impacted. Explicit phrases include “accelerate” development and “limit” emissions, more subtle phrases include economically and technically “feasible” production, which allude to the fact that production will continue. This seems to imply to the reader that both production and environmental protection are occurring and will continue to occur. It makes further development seem inevitable if production remains the *status quo*. This leaves the consumer with very little to ponder, as the continued use of oil and gas is assumed.

4.2. Perspectives of the Three Sources

The negative tone in the NGO reports is consistent with intent to point out the problems with extraction, production and use of oil and gas. For example, the word “potential” was used to discuss the potential environmental impacts and costs caused by production. The NGOs criticize the industry for the damage they caused to environment, as well as refuting the oil and gas industry’s ability to provide energy security for Canada. The reports provide a negative perspective of oil and gas, and often encourage the use of alternative energy sources. The arguments are often one-sided, providing a narrow view of the use of oil and gas energy products which may influence a reader to choose alternative energy sources where ever possible (see Mind Map supplemental file).

The industry reports are also one-sided with the clear intent being to encourage support for oil and gas production. Discussions about typically negative topics, such as “problem”, are turned into positive phrases, like “problem solving”. Themes such as economic “benefits” to Canadians were prevalent in order to gain public support for the use of oil and gas energy products (see Mind Map supplemental file).

The similarity of the government reports to the industry reports indicates the position of the government on oil and gas. Producing oil and gas products for use in Canada and abroad is portrayed as increasing the GDP and improving Canada’s and Alberta’s economic standing. The government

reports use similar positive language as the industry reports, discussing “conflict” management, as well as promoting oil and gas production, such as “enhancing” recovery. However, there is also discussion of potential issues with oil and gas production, making the government reports the most objective of the three sources. The reports also include the importance of returning the economic benefits to the citizens and of producing in a sustainable way which protects the environment. The government reports do not cover the full range of potential issues and therefore are not a holistic source for all information related to oil and gas which a reader can solely depend on for information related to using oil and gas (see Mind Map supplemental file).

As well as providing discussion which covers the positive and negative aspects of oil and gas production, the government also offers statistics and facts about production.

4.3. Different Discussion Using Same the Word: Themes

There is a different tone when it comes to development: while industry and government discuss development as a positive process, NGOs see development in terms of the impacts on the environment and the people. The primary concerns the industry and government had related to factors such as cost that could threaten sustained production, while the concerns of the NGOs related to damage to the environment and human health, as well as certain potential issues for the economy. Taken together the sources provide a range of perspectives on the topic of oil and gas which may enhance the decision making process.

While the NGO reports primarily focused on discussing the damage caused by oil and gas production, the industry and government reports discuss the actions taken to mitigate these problems. For example, “risk” in the NGO reports covers the environmental and human health risks while “risk” in the industry and government reports refers to risk assessments and risk management. Again, it is important for a consumer to understand the negative impacts and what is being done to address them in order to make an informed decision, therefore considering the information provided by all of the sources will allow for a more informed decision (see Mind Map supplemental file).

The contradicting “evidence” provided by the NGOs *versus* the evidence cited by industry and the government is not uncommon, nor is it unique to these sets of reports. Reference to evidence which proves the damaging effect of the oil sands and natural gas drilling is often used by NGOs to prove their case against the oil and gas industry. However, industry references evidence which says otherwise, that there is little or no damage caused by oil and gas production. It was interesting to see that the government also used the same evidence as industry, reinforcing the case that the government is in favor of oil and gas production. Contradicting evidence leaves decision makers confused on what is to believe. In order to address this issue, more transparency is necessary from all parties.

5. Conclusions

The oil and gas discourse in Canada is greatly influenced by the Canadian and Albertan government, NGOs and the oil and gas industry [1,3,4]. Not surprisingly, each of these three sources has its own take on the oil and gas industry. An analysis has revealed that there is significant contrast between the NGOs and industry, with the government siding more often with industry. Positive and negative aspects of the production and use of oil and gas are presented, sometimes using the same language in

different tones and sometimes contradicting other information. According to industry, there are many positive aspects of production while NGOs state otherwise, that there are many negative and destructive aspects. It is crucial that the information being provided in the discourse is understood by consumers as well as the bias it often contains linked to the originator of the information. It is also needed that consumers are able to compare and contrast the coverage by each of the sources to understand how the same words are often used to convey different messages and to convey different content. There is a plethora of information provided by each sector, and the authors submit that this information can become overwhelming to consumers, and can lead to a lack of understanding of the risks and benefits of using oil and gas. In order to provide a consumer with all of the relevant information, a mind map can be used which displays all of the information in a synthesized and organized manner. Dissemination of the findings in a meaningful way for the public will further enhance understanding of the oil and gas discourse.

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Conflicts of Interest

The authors declare no conflict of interest.

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