Research Summary

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Introduction

On January 20, 2021, the very day Joe Biden took office as the American president, he issued the "Exective Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis". The order contains six broad policy decisions–and one very specific one: TransCanada's construction permit for Keystone XL is revoked. The *Keystone XL* pipeline was supposed to be TransCanada's follow-up project to the *Keystone* pipeline which transports diluted bitumen from Alberta, Canada to Texas. Construction began in April 2020, after the permit was issued in 2019. The order revoking TransCanada's permit refers to a 2015 review of Keystone XL by the Department of State which found the pipeline to have a negligible economic impact, while posing a significant threat to the environment (DoS, 2015).

On the surface, the revocation of TransCanada's permit looks like a late victory for the environment. *Keystone* was built and Keystone XL began construction, but America finally came around. After an extensive discourse, the concern for the environment has come to dominate. For the oil and gas industry, the defeat of Keystone XL is highly symbolic and "may signal the end of major U.S. oil infrastructure" (Freitas et al., 2021). In other words, *Keystone XL* represents an important step toward the deinstitutionalization of pipelines through discourse (cf. Maguire & Hardy, 2009).

However, doubt should remain: How robust is the new status quo? Many actors continue to stand behind TransCanada. There are those who are directly or indirectly employed by the industry, and those studying subjects with deep ties to resource extraction, such as geology or engineering. And there are the communities for which oil & gas offers livelihood and identity–in an age where more oil can be extracted by less hands, maybe more of the second than the first. The three states that Keystone XL was supposed to cross never withdrew support for the project–TransCanada was at all time able to obtain all necessary permits at the state level. On the national level, the Koch family foundations, the American Petroleum Institute, and individuals from the oil & gas industry such as ExxonMobil CEO turned Secretary of State Rex Tillerson continue to hold a lot of sway and lobby for the interests of the industry.

My thesis studies the pipeline industry in the context of the cultural war that is being fought between environmentalists and proponents of the oil & gas industry. The second study, my job market paper, focuses on Keystone XL. The cultural war has for the most part remained a war of words but it has a distinctly physical dimension that is best exemplified by the 2016 Battle at Standing Rock related to the Dakota Access Pipeline. Sustainability scholarship conventionally focuses on a "cleaner" vision of progress that follows either from "enlightened" individuals inside of organizations (e.g., Howard-Grenville et al., 2017), or from economic motives (e.g., Flammer, 2015). The oil & gas industry holds an antithetical vision, where progress follows from economic development, and resource extraction is an economic necessity. Here, the OT literature can contribute with its rich body of works analyzing social process–think organizations and institutions, networks, and power (Davis, 2015; Ergene et al., 2020).

Studies

This section introduces three studies that are designed to generate research insights from the frail progress on the deinstitutionalization of oil and gas that is exemplified by the revocation of the permit for Keystone XL. The remainder of this document, after a brief summary of the *quantitative* data I have collected on the industry, focuses on the *qualitative* methods and data for the second study. The studies draw on institutional theory and organizational learning. Institutional theory is useful for explaining the stability of the current structure, and the challenges around substantial (as opposed to symbolic) change (Hoffman & Jennings, 2015; Meyer & Rowan, 1977). Organizational learning on the other hand emphasizes the potential for adaption, knowledge sharing, and vicarious observation, while keeping one eye on obstacles (Madsen & Desai, 2010, 2018; Rerup & Zbaracki, 2021).

Underlying all three studies is the understanding I have briefly developed above: that the polarization of the discourse on oil and gas has not been overcome by the defeat of Keystone XL. That the recent institutional developments in this area are characterized by twists and turns. And most importantly, that we should pay more attention to pipeline projects such as Keystone XL as potential precursor of the deinstitutionalization–or resurrection!– of oil and gas, and "expect the unexpected".

The *first study* focuses on the industry side of the discourse. The operation and construction of pipelines requires a social license. The US experiences over 100 significant [1] pipeline spills every year. [2] Pipeline operators routinely make references to technology–both clean-up technology, and pipeline safety technology–in their statements on recent pipeline spills. Since both the quality of implementation and effectiveness of these new safety technologies is highly opaque for external audiences, the risk of decoupling and symbolic adaption is high (Wijen, 2014). In other words, pipeline operators can use symbolic references to technology in conjunction with selective disclosure of information on spill causes as a means of greenwashing (Lyon & Montgomery, 2015). Study one explores the potential of technology as a device for greenwashing, using a mix of quantitative data on pipeline networks and spills, and qualitative descriptions of spill causes and responses.

The first study's theoretical focus on greenwashing limits the analysis to only one side of a richer discourse. Five communities have participated in the discourse on Keystone XL: pipeline operators, environmental activists, political decision makers, local residents, and the scientific community. The *second study* opens up the blinds to provide the complete picture of this multivocal environment. Participants meet in public forums across multiple years (Latour, 2005) and produce their own texts before and after, allowing us to repeatedly

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[1] The Pipeline and Hazardous Materials Safety Administration describes a pipeline spill as significant if the spill volume exceeds 50 barrels, or if one of three other criteria is met–see https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-flagged-files, accessed 2021-05-13.

[2] See https://www.jbarg.net/incident_dashboard.html, accessed 2021-05-13.

observe their beliefs, information exchange, and strategizing over time. Maguire and Hardy (2009) describe deinstitutionalization as a process of discourse and collective alteration of institutions. In the case of Keystone XL, we observe only a partial reconfiguration of knowledge networks, which leads to a frail deinstitutionalization of large oil and gas infrastructure projects (cf. Latour, 1984). Study two studies focuses on the different communities that participate in the discourse on Keystone XL (Aronczyk & Espinoza, 2019; Knorr Cetina, 1999), and how their participation on the Keystone XL discourse affects their understanding of the environmental risks and impacts related to pipelines and fossil fuels. Finally, I develop a model of the social process of deinstitutionalization in a multivocal environment.

The *third study* is a theory paper that applies the insights from studies one and two to the theory on organizational and collective learning. Whether a pipeline operators can maintain their public license does not only depend on the accuracy of the representations of their assets that they share with their audience. Rather, their models of the world need to become shared across a sufficient share of audience members. The learning literature similarly emphasizes the social dimension of learning–think vicarious observation (Madsen & Desai, 2018). The literature distinguishes between two dimensions–reliablity and validity (March et al., 1991). Reliability describes how widely shared a model of the world has become. Validity describes how useful the model is for prediction and control (Rerup & Zbaracki, 2021). Contrary to our intuition, models that are suboptimal in terms of validity can become widely shared in the world (Levitt & March, 1988). The third chapter is dedicated to the theory of reliability and validity.

Data on the pipeline industry

The studies are informed by three datasets on the pipeline industry that I have collected in preparation of the dissertation research. The Pipeline and Hazardous Materials Safety Administration (PHMSA) is the preeminent source of quantitative data on the pipeline industry in the US. PHMSA provides data on pipeline miles and the volume of oil transported (in gallon-miles) by operator every year. PHMSA also maintains a repository on every pipeline spill in the US. This repository includes the data we need to carry out study one–the location, volume, cause, and a narrative of every of the over 100 significant spills (¿50 gallon, or meeting one of three other conditions) that occur in the US every year.

In addition, the National Transportation Safety Board (NTSB) provides in-depth narratives of a small number of noteworthy pipeline incidents over an extended period of time. The NTSB uses its own resources to investigates these incidents and provides in-depth reports of usually 10-70 pages as well as shorter briefs. Since 1996, the NTSB has completed 53 investigations on pipeline incidents. These incidents provide an understanding of both the organizational and technological causes of pipeline spills (cf. Perrow, 1984).

Data Collection

This section introduces the data collection for study two. To understand the discourse on Keystone XL, and how it unfolded over time, we require a sample of texts that encompasses multiple relevant actors over an extended period of time. The first step toward building this corpus is to develop a timeline of events (Maguire & Hardy, 2009). The basis for that timeline are newspaper articles from the sampling period of 2008-2021. These articles were obtained from five major American national news outlets through Factiva by searching for the Keywords "Keystone XL", and "KXL". Further, articles on Keystone XL over the sampling period were collected from the Oil & Gas Journal.

The timeline on Keystone XL includes multiple public forums (Latour, 2005). These public forums serve two functions in this study. (1) They allow for the identification of relevant participants in the discourse. 12 types of participants participate in the forums, 6 of which are specific organizations that participate repeatedly. (2) The public forums are a compressed version of the discourse itself, where actors lay out their understanding of the permit application process, of Keystone XL, and of its environmental impact. The actors also respond to each others claims in this forum, laying bare the extent to which they have engaged with each others' arguments. I.e., a rebuttal testimony begins with a summary of the other side's position, and make a useful gauge of engagement and comprehension.

By selecting on the participation in forums, we obtain a sample of actors that are both knowledgeable and engaged. To participate in the public forum, an organization needs to both familiarize itself with the formal process and strategize, as well as obtain and organize expert knowledge.

The final step toward creating a sample of texts is to gather the communication of the actors on Keystone XL over the time of the discourse. Most of the communities have formed and organize themselves through websites. Documents on TransCanada, Keystone XL, and the Sierra Club are also published online. The documents are downloaded by hand, or automatically through web scraping where appropriate. In some cases, the texts are automatically filtered to retain only those that discuss Keystone XL, using the keywords "Keystone XL" and "KXL". The filtered texts, and the texts from step two constitute the final sample that is imported into ATLAS.ti for the data analysis.

Methods

The purpose of this study is to extract the meaning of words and phrases from text (Parker, 1992). We identify the main themes of the discourse by reviewing and coding the public forums. To decode their meaning, we first reference the timeline of events that was compiled in the first step in the section Data Collection (Maguire & Hardy, 2009). We then turn to the texts that the community has produced ahead of the forum. Connecting themes from the forums with texts that were produced ahead of the forum, allows us to more accurately decode their meanings. Texts that are specific to the forum sometimes reveal a

community's strategy for the forum.

We have now obtained coded meanings and strategies on the forum. The next step is to compare coded themes before, during, and after. To obtain a process model of the discourse, we code the texts produced by all communities ahead and after each forum. Discrepancies between the before and during provide more information on the communities' strategies. Discrepancies between the during and after suggest an evolving understanding through exchange at the forum. Finally, we track themes across communities and across time throughout multiple forums. This step allows for the identification of more connections and overarching trends.

In addition to the analysis of texts, this analysis uses interview data. The primary function of the interviews is to test the robustness of our findings. For that purpose, I compile timelines on the discourse for each community. These timelines are shared with interviewees from the communities to triangulate events and ensure completeness of the data. Where data is incomplete, we return to the previous step and review the findings, before carrying out more interviews.

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