“The Living Cow”:
A frame analysis of support for and opposition to hydraulic fracturing in Argentina

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Abstract

Hydraulic fracturing is a technique used to access and extract natural gas and oil. As of late it has gained a great deal of attention. Its use has far reaching potential to reshape the global energy landscape since it enables extraction of previously unattainable natural resources. But up to date, the advancement of the practice raises several questions. Concerns regarding socioeconomic consequences, environmental effects and health impacts are some of the voiced in related to hydraulic fracturing. Owing to the Vaca Muerta (Dead Cow) shale formation, Argentina has proved to be one of the countries in the world with largest unconventional natural gas and oil deposits. The implementation of hydraulic fracturing in Argentina has led to a lively debate regarding its pros and cons. Through a qualitative frame analysis, this thesis examines how actors express support for and opposition to hydraulic fracturing in Argentina.

Key words: Hydraulic fracturing, fracking, frame analysis, support, opposition
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1. Introduction

The interest for hydraulic fracturing (commonly referred to as “fracking”) has spread extensively during recent years. It has rapidly become one of the most influential – but also most debated – techniques used in the production of fossil fuels. Fracking has already made a great impact on the global energy landscape since it has enabled extraction of hydrocarbons\(^1\) in locations where they were not technically possible to obtain before (Baker McKenzie 2014:1, McKinsey 2012:30). At the same time, the topic has become a great controversy since the short and long-term effects of the practice are ambiguous, especially with regards to its impact on socioeconomics, the environment and human health (Bomberg 2013; McKinsey 2012; Perry 2012; UNEP 2012).

The fossil fuel resource deposits hydraulic fracturing is applied to differ from conventional deposits of natural gas and oil. For that reason, resources obtained with this technique have come to be known as unconventional (Morgan Stanley 2014; Credit Suisse 2012:12). Reports issued by the U.S Energy Information Agency (EIA) have confirmed that Argentina is one of the countries with greatest potential for extracting unconventional fossil fuels (UFFs) in the world (EIA 2013). The process of exploration and extraction in Argentina is currently in its initial stages but there is already a lively debate regarding the pros and cons of applying hydraulic fracturing to produce natural gas and oil. Many aspects and factors contribute to shape the hydraulic fracturing discourse and a selection of its content in relation to the Argentinian context is reviewed in this thesis.

This study examines expressions in texts and images of both positive and negative implications of the use of fracking in Argentina and - more specifically - it explores the ways in which actors express themselves regarding the effects of hydraulic fracturing on Argentina’s socioeconomics, environment and human health. The actors of interest to this study are either protagonist – i.e. for fracking – or antagonist – i.e. against fracking and the analyzed material is composed of texts and images produced by the actors themselves. Pro- and anti-fracking expressions are in the analysis reviewed through a method named frame

\(^1\) Hydrocarbons are organic compounds made of carbon and hydrogen. They occur as gas, liquid or solid (EIA 2015) and are the main compounds in coal, crude oil and natural gas (Gcsescience 2015, Businessdictionary 2015). Hydrocarbons are used in a number of ways and in various products - fuel being one of them (Businessdictionary 2015).
analysis\(^2\) which is suitable when examining how actors present ideas, problems or preferred policies to the public and policymakers (Bomberg 2013).

The potential use of the fracking technique is comprehensive, as is the scope of interest for the phenomenon it has become. Stakeholders in Argentina have varying opinions regarding the effects it will have and the trade-offs it will involve, which is why it is of interest to examine the words and arguments used to either gather support for or opposition against hydraulic fracturing. In Argentina, the topic is very often put in relation to the Vaca Muerta (Dead Cow) shale formation\(^3\) in the Neuquén basin (see map in appendix on p.37) where around 40% of the country’s shale gas and 60% of its shale oil is estimated to be located (Business Insider UK 2014).

During December 2014 and January 2015, I had the privilege of travelling to Argentina. This trip is where the idea of “fracking frames” stems from. As I visited the provinces of Neuquén and Río Negro, in which hydraulic fracturing sites are already in place, it became apparent that the presence of fracking in these provinces is highly controversial. But before getting deeper into this topic the research question as well as contextual insights will be presented.

2. Purpose and research question

The purpose of this thesis is to analyze actor’s arguments and expressions for and against the use of hydraulic fracturing in Argentina, in relation to frames. By conducting a qualitative case study based on antagonist and protagonist documents—through which actors channel their views on fracking—this thesis attempt to adequately answer the subsequent research question:

\(^2\) Frame analysis includes a number of branches for analyses and it is applied in various academic fields. In this paper however, the term is used with reference to the ways in which agenda setting literature commonly uses framing, i.e. by “defining, selecting and emphasizing particular aspects of an issue according to an overarching set of underlying assumptions […] for example show how frames convey arguments about the nature of the issue (its severity, incidence, novelty, proximity) as well as its responsibility (government, individual, market). Finally, frames identify problems in a particular way but also hint at how such problems may be solved.” (Bomberg 2013:4).

\(^3\) Shale is a sedimentary rock which acts as a source and reservoir for natural gas and oil (EIA 2015). Natural gas which is produced from shale formations is often called “shale gas” and the oil is often named “shale oil” or “tight oil”. Shale rock is relatively solid, hence the term “tight oil”. In general, “shale resources” refers to gas and oil whose source is a shale formation (EIA 2015, Baker and McKenzie 2014).
“How is opposition against and support for hydraulic fracturing in Argentina expressed in texts and images by six actors with clear stands regarding the impacts of the practice?”

In the Argentinian context, it is of interest to identify how oil and gas companies make their case for fracking and how non-governmental organizations (NGOs) argue against it. The rights to drill for fossil fuel resources in Argentina are not provided by the central government, as in most European countries (IEN 2013), nor by private landowners, as is usually the case in the U.S (Bomberg 2013:6). Instead, the permits are issued by the provincial or local governments (FoE Europe 2014). In order to obtain drilling rights, the oil and gas companies have to negotiate with the provincial governments. The arguments companies use to gain public support for their activities are hence intriguing. Meanwhile, the anti-fracking organizations are set on raising public awareness to the downsides of fracking. This provides incentives to map out the arguments and how they are linked to distinguishable frames used by fracking advocates and fracking antagonists. The frames at play in the debate are important components since the frames that become predominant are likely to affect how the matter is handled politically (Pralle 2009).

In some local Argentinean cases authorities have issued fracking-free zones and fracking has even been banned in 15 provinces, while it remains legally permitted in others (FoE Europe 2014; OPSur 2013). This implies that there is a potential ambiguity in how local politicians have reacted to the contents of the fracking discourse, and also, how they and the public have perceived the socioeconomic and environmental impacts of the presence of hydraulic fracturing developments.

As mentioned, the purpose of this thesis is to map out and analyze the various expressions and images regarding the fracking development in Argentina and the frames that they can be put in relation to. This will be done from a sociopolitical point of view and the main aim is to find articulations that come into conflict with each other. The aim is thus to find the most clearly and well-articulated forms of support and opposition and to gain more knowledge about how actor’s arguments relate to frames. A validation of the level of truth to specific and technological claims lies beyond the scope of this thesis. Instead, the ambition is to bring about a deeper understanding of the views that are expressed in relation to the topic.
3. Background

3.1. The technique

Technically, hydraulic fracturing refers to the process of creating fractures in tight sediments with low porosity, such as shale. The fractures are created by an injection of water, mixed with sand and chemical additives (together these three ingredients are commonly known as fracking fluid) into the wellbore under high pressure. Fossil fuels are “trapped” in the pores of the shale and can therefore not be retrieved through conventional methods of extraction. However, the high pressure of the injected fracking fluid causes the sediment to crack. The cracks are then held open by sand, which allows fossil fuels to flow more freely so that they can be extracted for commercial purposes (Baker and McKenzie 2014). The term hydraulic fracturing is often used in general to refer to the entire process of extracting UFFs and is thus not entirely delimited to its literal and technical meaning.

The fracking technique is not new per se; it has been used in conventional oil and gas projects for decades. But its more recent use has been quite revolutionary and in combination with other technical advances, such as horizontal drilling, it has enabled oil and gas extraction from previously unavailable sources (Morgan Stanley 2014).

3.2. Hydraulic fracturing in the U.S, China and Europe

Hydraulic fracturing is currently a global phenomenon and several nations around the world are either applying the technique or exploring the possibilities to make use of it. Fracking is for instance frequently named as the main contributing factor to the ongoing “shale revolution” of the U.S (Credit Suisse 2012:1; Morgan Stanley 2014:4; Baker and McKenzie 2014:1). The proportion of unconventional gas produced in the U.S has increased drastically since year 2000 and accounted for around 60% of the total natural gas production by 2010 (Credit Suisse 2012:6). Extensive expansion of UFF production in the U.S is consequently regarded as a global game changer since it impacts the global flows of fossil fuels “and thereby altering energy geopolitics” (Baker McKenzie 2014:4). While the production of UFFs is steadily increasing in the U.S, and is expected to do so for several decades (McKinsey 2012), the future prospects vary greatly between nations with UFF potential.

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4 “A wellbore is a hole that is drilled to aid the exploration and recovery of natural resources including oil, gas or water. A wellbore is the actual hole that forms the well.” (Investopedia 2015b).
Estimates place China as the country with the largest recoverable shale resources in the world – with twice the volumes of those in the U.S (Baker and McKenzie 2014:40; Credit Suisse 2012:7). However, China still has several steps to take in order to become a major actor in the field. Political settings, institutional designs, property rights, pipeline arrangements and geological conditions of shale formations make it more challenging to utilize shale resources in China, compared to the U.S (Baker and McKenzie 2014; Credit Suisse 2012; Morgan Stanley 2014).

There are many countries in Europe with shale resources as well but due to a combination of structural and political factors, the production of UFFs has been quite hesitant and slow in Europe (Bomberg 2013).

In general, shale resources exist in varying quantity and quality around the world. But more interesting is the fact that some nations and regions are investing greatly to develop these resources while others remain quite passive. This hints at the seriousness of the issue. UNEP recommends that “The question of whether to allow or ban gas fracking needs to be carefully assessed by relevant authorities” (2012:1).

3.3. The Argentinian context
Argentina has a long history of hydrocarbons production. Its oil and gas industry dates back to the early 20th century, along with the establishment of the national energy company Yacimientos Petrolíferos Fiscales (YPF). The state-owned company had a monopoly on fossil fuel extraction for several decades, but in the 1990s, the Argentinian oil and gas sector was deregulated and YPF became a private corporation as it was sold to the Spanish company Repsol.

The Argentinian production of fossil fuels reached its peak in the late 1990s and then started to decline. The national government blamed Repsol for the declining production and based its accusations on Repsol’s inadequate management of YPF and underinvestment in the national oil and gas sector (Baker & McKenzie 2012; Baker & McKenzie 2014). By 2011, the former energy exporting Argentina experienced an energy deficit and started to import fossil fuels. The energy imports have been increasing ever since, along with an increasing demand for energy (Business Insider UK 2014; Forbes 2015).
In 2011, the U.S Energy Information Agency (EIA) issued reports which affirmed that there are large quantities of shale resources in Argentina, primarily in the Neuquén basin and the Vaca Muerta shale. The first report was later reaffirmed in 2013. These reports placed Argentina among the top three nations with largest potential to produce UFFs in the world and the Neuquén basin was described by the EIA as “[…] the premier shale gas and shale oil development area of South America.” (EIA 2013:27).

In 2012, the Argentinian government reclaimed 51% of the company YPF through a legislation called Ley 26.741, also known as the YPF Expropriation Act. This legislation contained energy goals and policies which, among other things, meant that hydrocarbon self-sufficiency became a national priority (see InfoLEG 2005). In the aftermath of these events, YPF has directed a lot of attention to UFF production and investments have been made in order to further develop the Neuquén Basin and the Vaca Muerta shale (The Economist 2014).

It has been argued that the introduction of fracking in the Neuquén area is convenient due to a number of structural factors. Frequently mentioned aspects are already existing infrastructure for oil and gas production (Credit Suisse 2012); the presence of massive water resources (which is a key component of fracking operations); the geological conditions of Argentinian shale formations; and the geographic location of the hydrocarbons in relation to the low population density in surrounding areas (Business Insider UK 2014). To a great deal of actors the prospects of UFF extraction is seen a most welcome development. The grand potential of the Vaca Muerta shale, which in size compares to Belgium (The Economist 2014), attracts foreign investments in YPF (Buenos Aires Herald 2014) and Argentina’s president, Cristina Fernández de Kirchner, has stated that “I shall no longer call [it] Vaca Muerta […] I shall call it Vaca Viva (‘Living Cow’)” as a way of expressing her enthusiasm for the development of Vaca Muerta (The Economist 2014).

But there has also been strong mobilization against fracking in Argentina by actors who does not approve of its use. A quite dramatic example of such anti-fracking mobilization is a protest which took place in the Neuquén province in 2013. The protest was a reaction towards a deal between the two companies YPF and Chevron – a deal which has to be ratified by local authorities before it could enter into force. Protesters were disconcerted by the lack of involvement of civil-society in the process and around five thousand people participated during the first day of the protest-march. Over 25 people were injured by rubber bullets or teargas and several people were detained by police. The protest continued the next day, during
which the number of participants had doubled to around ten thousand (Environmental Justice Atlas 2014).

The split between hydraulic fracturing protagonists and antagonists in Argentina is the focal point for this thesis. By examining text- and image expressions regarding fracking in Argentina and analyzing those expressions in relation to frames which are constructed in relation to the topic, this study hopes to bring further clarity to how actors push agendas and argue for policy changes. The general aspects raised in the hydraulic fracturing discourse are many, as are the actors involved in its construction. The below chapter will outline some of the frequent claims of effects of hydraulic fracturing and address what scholars on the topic have studied and concluded.

4. Previous research

Much of the research on the effects of hydraulic fracturing has been conducted in the U.S. However, in the analysis below it will be shown that the scientific and empirical experiences from the U.S. are also used to promote and oppose hydraulic fracturing in Argentina.

Studies of positive effects of hydraulic fracturing has suggested that it can be an approach to mitigate greenhouse gas emissions – since natural gas releases less carbon dioxide than coal when it is used for electricity – and the vast shale gas deposits worldwide is regarded to potentially be able to minimize the global reliance on coal for energy (Hultman et al. 2011). Shale gas in the U.S is also seen as a potential bridge fuel as the development of shale formations “could reduce the costs of the transition to an economy with lower greenhouse gas emissions” (Considine et al. 2010:6). These calculations are not unequivocal however and UNEP (2012:1) states in a report that “The potential climate benefits of coal-to-gas substitution are both less clear and more limited than initially claimed”. Moreover, hydraulic fracturing is frequently brought up in a positive light as a means for countries with shale resources to increase their national energy security and independence (UNEP 2012). The UFF production is also said to bring about employment, large scale investments and have positive effects on national, regional and individual economy and incomes (Considine et al. 2010).

But there are also several studies and assessments on a wide range of potential negative impacts due to hydraulic fracturing. Such studies have focused on environmental and human health factors such as; eco-system and wildlife impacts; seismological effects; impacts on air quality and greenhouse gas emissions (see Perry 2012:354). A study by Osborn et al. (2011)
focuses especially on contamination of drinking water in association with shale gas
development and the study presents “systematic evidence for methane contamination of
drinking water associated with shale gas extraction” (Osborn et. al 2011:8172). The latter
aspect is perhaps the one drawing most negative attention to hydraulic fracturing among
scholars, media, the public and policymakers.

Other studies have focused on socioeconomic impacts and skewed economic benefits related
to boom-and-bust cycles (see Stedman et al. 2012) and societal costs of shale developments
such as; “large-scale and rapid landscape change, overall feelings of uncertainty, an increased
number of new people […] in their community, and a sense that their communities are
changing almost overnight from rural to industrial and more urban” (Perry 2012:353). Without stepping too far out of line, one could claim that fracking has created a societal and political fracture between those who are in favor of its use and those who oppose it.

Academic work addressing the publics’ and actors’ expressions and perceptions of hydraulic
fracturing is already in place. However, as previously mentioned, much of the work has been
conducted in the U.S context (see Boudet et al. 2014; Hudgins and Poole 2014; Jacquet 2012;
Perry 2012; Stedman et al. 2012). Furthermore, many analyses which deal with expressions
and perceptions of fracking are quantitative; thus dealing with larger samples than this study.
Such studies have for example analyzed 5 million tweets to capture public perceptions of
fracking (Hodges and Hassel 2015), public perceptions (N=1061) of fracking in the U.S
(Boudet et al. 2014) and 1.024 landowners’ perceptions of fracking in Northern Pennsylvania
(Jacquet 2012).

As discussed above, hydraulic fracturing is a complex technical issue as well as a complex societal issue. Structural reasons for its complexity, such as economic-, geographic- and technological factors, have been given a lot of attention. But so far a smaller amount of research has dealt with how actors engage in the fracking discourse to shape the agenda (Bomberg 2013).

Bomberg (2013) has studied agenda-setting differences in the U.S and Europe as well as the frames used by pro- and anti-fracking networks in the U.S and Europe. Bomberg’s study has been influential to this thesis, particularly in terms of the framework used in the frame analysis, something which will be further elaborated in the methodology chapter.
The topic of fracking is frequently occurring in academic and journalistic writings as well as in public debates. But since fracking is a relatively new phenomenon in Argentina there are many aspects that remain to be explored. A qualitative frame analysis of how actors express opposition to and support for fracking in Argentina is one such aspect to be considered. As this study analyze articulations in the hydraulic fracturing discourse, a frame analysis is arguably both suitable and desired since scholars on the subject request in-depth case studies as well as studies of other parts of the world than the U.S and Europe (see Bomberg 2013:18).

5. Methodology

5.1. Frame analysis
Frame analysis is commonly used for studying ideas in politics and it provides the potential of capturing problem formulations and the construction of political ideas (Erikson 2011:10). In this study, frame analysis will not be applied on politics per se, such as a debate within a government or on a legislative decision. Instead, the analysis is directed to the expressions of actors involved in a debate which indeed stands in relation to the politics surrounding it. How specific ideas are formulated and presented to policymakers and the general public is at the heart of interest in a frame analysis (Bomberg 2013).

Framing can also be used as a tool for capturing articulations of causes to problems and solutions to them (Hodges and Hassel 2015; Bergström and Boréus 2005). To understand the ways in which an issue is framed can shed light on how the issue is understood by people, particularly the people who create the frames, but also to understand the ways in which people who are subjected to the frames are faced with different versions, or ideas, on the same topic.

In this case, supporters and opponents who essentially address the same phenomenon – fracking – have focused on presenting widely different images of it. While the pro-side highlights prospects of economic growth; secure domestic energy supplies; and the mitigation of greenhouse gas emissions, the anti-side focuses on potential negative effects on human health; the environment; and communities close to hydraulic fracturing sites. Due to the existence of these conflicts, it becomes important to understand how support and opposition is shaped, especially for “government agencies attempting to establish appropriate regulations (New York State Department of Environmental Conservation, 2013); and for researchers,
advocates, and others interested in communicating about potential impacts (Clarke et al., in press).” (Boudet et al. 2014:57).

One of the main presumptions when analyzing data through frame analysis is that articulations of ideas are of substantial interest because ideas stand in relation to actions. Ideas can function as both enabling and disabling of actors’ behavior in the sense that actors are obliged to relate their actions to ideas (Erikson 2011:10). The manifest idea of human rights can offer an example. Governments, politicians, rebel movements, companies, NGOs, and others, are obliged to relate their deeds to this notion. When performing specific actions, such as implementing legislative proposals, engaging in armed conflicts, arms dealing or monitoring of conflicts et cetera, their actions will be put in relation to the idea of human rights. Actions can either be in accordance with that notion or in asymmetry with it. Actors are also likely to refer to this notion when an adversary is in proximity of breaking it. Whether human rights are something naturally given or socially constructed is irrelevant to this point. The meaning and the value that it is given to human rights as a notion is socially constructed; the point being that the far reaching acceptance of this idea makes actors obliged to relate to it. The same can be said for the expansion of voting rights. The idea of more inclusive political systems challenge the contradictory notion that not all people are equally entitled to participate in elections of political representatives. When the notion of a more inclusive political system gains public and wide acceptance, that notion compels actors to relate to it in their actions. Once an idea has been publicly accepted, or even institutionalized through legislations, it is likely to receive interpretative prerogative which strongly influence the acting space of the players on the arena. Even actors who challenge the publicly accepted problem formulation are still likely to have to relate to it as they argue against it (Erikson 2011:11).

In the case of the fracking debate in Argentina, there are competing problem formulations at stake. Whether hydraulic fracturing is perceived as a problem, and in that case why, will likely have effects on the political actions that are taken to address it. Bomberg (2013:4) describes actor’s purpose of using frames as “to increase or decrease attention to them [the frames], mobilize actors or de-mobilise them, and direct policymakers towards solutions” (Author’s note) and continues “Whose definition or frame takes hold is important because it shapes how an issue is handled”. The latter citation highlights why it is of interest to explore the ways in which protagonists and antagonists use distinguishable frames to make their cases for and against hydraulic fracturing in Argentina. In order to reach a conclusion as to how this
is done, it is of interest to see how actors engaged in the fracking discourse relate their arguments to different topics in order to connect the term “fracking” with positive contra negative connotations. Bomberg’s framework (see 2013:6pp.) was helpful in this regard as it provided a general model for the types of notions and connotations which could be expected to be found in the material which this study reviews. Bomberg’s paper address actors who either express opposition to or support for fracking in both the U.S and Europe and although the geographical contexts for the analyses are not the same, Bomberg’s framework has inspired the analytical framework presented below.

5.2. Analytical framework

The analytical framework which has been used to categorize the frames of interest to this study is fairly straightforward. The first step was to identify actors who either support or oppose fracking in Argentina. The material, i.e. the analyzed documents, was gathered with the intent of representing the actors and their views of hydraulic fracturing. The documents were then read with the aim of finding its most explicit content, which resulted in the creation of four dominant frames. These frames were by all means the most frequently expressed throughout the material. Although they contained different connotations depending on the actor who expressed them, these frames were sufficiently narrow to make them distinct from each other while at the same time sufficiently broad to embody the majority part of the expressions found in the material.

All the frames stem from articulations about hydraulic fracturing, which is the starting point of the analytical tool (see 1. in the Framework Table on the next page). The frames are characterized by articulations of socioeconomic impacts and environment & health impacts, while the actors who expressed them were categorized as protagonist or antagonist (see 2. in the Framework Table). This finally resulted in the two protagonist frames named The Socioeconomic Development Frame and The Safe Frame, and in the two antagonist frames named The Socioeconomic Disintegration Frame and The Risk Frame (see 3. in the Framework Table).

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5 Connotations are qualities that are associated with words in addition to their factual meaning - “The abstract meaning or intension of a term, which forms a principle determining which objects or concepts it applies to” (Oxford University Press 2015).
In order to categorize statements and expressions within the above frames, certain terms have been used as indicators. These indicators were derived from Blomberg’s (2013) results in an analysis of U.S and European actors and frames. Because the context of interest to this study differs from Blomberg’s (2013) study, the exact same terms has not been used. However, they functioned as a general guideline in the development of the indicators used in this study.

In *The Socioeconomic Development Frame* the indicators are; *energy security, energy self-sufficiency* and *economic growth*. In *The Safe Frame* the indicators are; *safety, health awareness, environmental awareness, safe technology, safe chemical compounds, and sufficient regulations and monitoring*. Indicators of *The Socioeconomic Disintegration Frame* are; *implemented policies do not serve public interest, negative impact on economy, and violations of indigenous communities’ rights*. Last, the indicators of *The Risk Frame* are; *air-, land-, and water pollution, insufficient regulations and monitoring, and climate change impacts*.

## 6. Material and actors

### 6.1. Material

The design of this thesis builds on a qualitative study of a diverse material. The data is composed mainly of NGO reports which address hydraulic fracturing in Argentina; oil and gas companies’ documents and reports addressing their hydraulic fracturing operations in Argentina; and to some extent their operations and projects in general. Although it is not optimum, there is a reason for including material from oil and gas companies that is not provided for the Argentinian case specifically. The companies which operate in Argentina often have production projects in a number of countries and therefore information about and

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<th>2. Environment &amp; Health</th>
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### Framework Table

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views of hydraulic fracturing is oftentimes expressed in general, rather than on a country-specific basis. This proved to be particularly true in the case of Exxon Mobil Corporation. Therefore these types of generally expressed views have been interpreted as applicable to all their operations, including those in Argentina, unless something else was specifically stated in the material. The latter point of interest is interesting in itself. It raises the question of whether the oil and gas companies are prone to provide this type of country specific information, or if they rather address the phenomenon with disregard to national context. However, the scope of this thesis does not allow for an answer to this question.

Except from distinct reports and documents, material found on the websites of oil and gas companies, as well as blogs of NGOs, have been included in this study. This type of material has been selected for a number of reasons. First of all, it is provided by the actors of interest to this study. This is regarded as beneficial since the aim of this study is to gain knowledge of the actors’ expressed views of the topic at hand. It has therefor been deemed that the material should be as “close” to the actors as possible and, consequently, the material provided by the actors themselves is favored over material from second hand sources (see Teorell and Svensson 2007:106). Secondly, since this material is available on their websites it is reasonable to assume that the actors are prone to expose it to the public and thus it is also reasonable to assume that such material is in line with the companies’ or NGOs’ core values, beliefs or official policies.

The material has been gathered with the purpose of being well articulated for the specific views of the NGOs on hydraulic fracturing in Argentina on one hand, and the specific views of the oil and gas companies on the other hand. These two groups can arguably be said to represent two fundamentally contradicting views on a number of issues that relates to the hydraulic fracturing debate.

6.2. Actors

6.2.1. Protagonist actors

The protagonist actors included in this study are three of the most prominent oil and gas companies currently active in Argentina. All three of them are currently involved in fracking projects in the Neuquén province or the Vaca Muerta shale and they all have explicit views of the potential benefits to be drawn from these projects.
The partly state-owned company YPF expresses itself unequivocally regarding the necessity of UFF extraction. The material in which the company’s views are expressed is a document, which is available at their website, named “Petróleo y Gas no Convencionales: El Desafío Energético de la Argentina” (Translation: “Unconventional Oil and Gas: Argentina’s Energy Challenge”) (YPF 2013a).

*Exxon Mobil Corporation* is the largest publicly traded international oil and gas company in the world (Exxon Mobil Corp. 2015a). Moreover, the company has been active in Argentina for over 100 years and the company regards itself as a part of Argentina’s oil and gas industry history (Exxon Mobil Corp. 2015b). Exxon Mobil has been present in the Neuquén province since 2010 when they started to explore the potential of the the Vaca Muerta shale. This study looks at their views of the impacts of hydraulic fracturing based on a document named “Unconventional Resources Development – Managing the Risks” (Exxon Mobil Corp. 2014).

*Total* is also an important oil and gas actor in Argentina, since the company produces nearly 30% of the country’s gas and has been operating in Argentina for a relatively long time – since 1978. The information of their activities in Argentina and their views of the impacts of hydraulic fracturing activities has been gathered from their website. The documents are named “Society and Environment Report 2011”, “Doing business responsibly: CSR Report” (Total 2013) and “Registration Document 2014”.

The companies primarily point out that the use of hydraulic fracturing could provide *energy security* and enhance *economic growth* while at the same time safeguarding *the environment*. These specific connotations will be discussed in further detail below, starting with “the socio-economic frame” and then followed by “the environmental frame”.

### 6.2.2 Antagonist actors

The antagonist actors in this study are three NGOs. One of them is international while the others are based in Argentina. They all have in common that they have produced reports and writings which expresses the implications and effects of fracking from a clearly negative point of view with regards to socioeconomics and the environment.

“*Friends of the Earth Europe*” (*FoE Europe*) is a large environmental network which acts as an umbrella organization for over 30 national organizations and thousands of local groups. It is also a part of Friends of the Earth International which unites over 70 national member organizations. Together with the Buenos Aires based organization “*Observatorio Petrolero*
Sur” (OPSur), Friends of the Earth Netherlands and Les Amis de la Terre, they have produced a report named “Heading South: The Dash for Unconventional Fossil Fuels in Argentina” (FoE Europe 2014). It addresses the development of UFFs from a clearly negative point of view and has therefore been chosen as part of the material. The frames found in the report will be discussed in further detail below. However, the ways in which this report is articulated is of interest because it is presented by a large environmental organization with the potential to reach a large number of people with its message; that hydraulic fracturing poses a threat to socio-environmental rights, regional economies and to indigenous communities.

Centro de Derechos Humanos y Ambiente (CEDHA) (translation: The Centre for Human Rights and Environment)
This organization is based in Córdoba, Argentina. While they work with multiple topics regarding human rights and the environment, they have produced a document which highlights the potential risks and dangers of fracking. The document was conducted with the particular purpose of informing communities and concerned citizens about fracking, but also to function as an informative linkage between company representatives and policy makers. The aim of the organization is also to reach a “constructive discussion about fracking and its implications for the environment and people in Argentina.” (CEDHA 2012:7).

Observatorio Petrolero Sur (OPSur) (translation: South Oil Observatory)
This organization has their offices in Buenos Aires and in Neuquén, Argentina. They actively engage in the hydraulic fracturing debate with a clearly antagonistic approach, on their website and in social media among other forums, and that is how they became relevant to this study.

7. Analysis

7.1. Protagonist frames

7.1.1. The Socioeconomic Development Frame
YPF’s primary promotion of hydraulic fracturing is based on highlighting that UFFs are necessary for providing Argentina’s various economic sectors, both public and private, with the energy that they need. Shale resources are said to be fundamental to keep the country growing. The company states that “Due to the decline of conventional natural deposits and the steady increase in demand for fuels, it is necessary to explore and add new resources” (YPF 2013a:2). YPF also states that unconventional resources are central components to
Argentina’s road to self-sufficiency (YPF 2013a:2). Furthermore, the energy reports produced by the EIA are underlying the company’s announcement that Argentinian shale resources could “ensure energy self-sufficiency for, at least, the next 50 years” (YPF 2013a:7). These connotations are frequently repeated by the company and they are explicitly expressed in the following sentences:

“Argentina is starting to walk this path that will allow to solve its energy needs and to regain self-sufficiency. YPF takes on the challenge of developing unconventional resources for the country to keep growing.” (YPF 2013a:5) (Emphasis added).

Moreover, the Vaca Muerta shale is described as “A historical opportunity” (YPF 2013a:11) and YPF illustrates this point by providing an economic perspective to the significance of the resources sitting within the shale. The company does so by projecting that “The energy deficit of the country could be covered with the development of a part of Vaca Muerta” (YPF 2013a:11). Statements such as the above are clear expressions of just how much Argentina has to gain from the extraction of resources in the Vaca Muerta shale. The statements are also highly pedagogical and easy to grasp illustrations of the resources significance to the country. All the above statements consistently illustrate that YPF regards unconventional oil and gas as primary resources for ensuring Argentina’s economic growth, energy security, and in the long term; its energy self-sufficiency.

Similar connotations which are put in relation to the extraction of UFFs are strengthening of local businesses and regional economies. The extraction of unconventional resources is said to create jobs, both directly and indirectly, through hiring of local suppliers et cetera. This is considered to create a virtuous cycle of growth and promote the development of regional economies (YPF 2013a). This view is also clearly exemplified through statements such as “The development of a single cluster of shale, which covers an area of 290 km², creates 1,600 direct job positions and nearly 5,000 indirectly” and “Experience elsewhere in the world indicates that shale production […] favors the growth of the regions, since the activity mobilizes significant resources and promotes new jobs” (YPF 2013a:16). That the oil and gas sector’s activities should benefit local communities is also expressed by Total and Exxon Mobil. Total accentuates that they have a special responsibility for the socioeconomic development of the communities nearby their project sites and that they make efforts to ensure that their activities benefit the socioeconomic development of these communities (Total 2014:188,200). Exxon Mobil stresses the same point as they state that “The well-being
of the communities in which we operate is more than a business concern – it’s personal.” (Exxon Mobil Corp. 2014:33).

The last-mentioned ways of addressing the topic ties the socioeconomic development frame together. The most eloquent features of this frame lie in the arguments of YPF; that the presence of the oil and gas sector, and the extraction of UFFs through hydraulic fracturing, would benefit local, regional and national development, economic growth and energy security.

7.1.2. The Safe Frame

The main function of this frame is to emphasize that hydraulic fracturing is safe with regards to the environment and to people’s health. It thus serves to downplay the worries and concerns people might have regarding the hydraulic fracturing process. This frame is articulated in several ways but with the same core message: shale resources are extracted in a manner which is safe in relation to health and the environment.

Firstly, YPF emphasize that there is a national regulatory framework in place for the oil industry in Argentina, which in turn is supplemented by the specific regulations of the provinces. The latter frameworks are said to be of particular importance since the provinces can adapt their regulations to local geographical conditions (see YPF 2013a:13). Regarding the use of water, YPF states that “The regulations for the use, treatment and re-use of water are rigorous, and thorough controls are made by the environmental authorities at provincial and national level” (YPF 2013a:15). The implication of these statements is that there are adequate-, dual-, and public regulatory systems in place, which serves to prevent the UFF extraction from harming the well-being of people and the environment.

Moreover, the companies themselves point out that they are highly concerned with safety in their operations and that they follow strict protocols to protect human health and the environment (see Exxon Mobil Corp. 2014:1,13,19; YPF 2013a:13). Total eloquently states that they comply with external regulations; that they have internal protocols for environmental protection; and that they engage in local actions to inform people of their projects, in the following statements;

“First and foremost, we comply with all applicable legislation and regulations in our host countries. They govern our work with local water agencies. That said, we have our own rules, which are sometimes more stringent than local ones, to protect aquifers. We apply them in all our projects.” (Total 2011:61).
“In Argentina, TOTAL has stakes either as an operator or partner in several shale gas licenses in the Neuquén basin. Although the large-scale development phase has not yet begun, proposed initiatives for minimizing the impact of the shale gas and oil operations are routinely and regularly assessed […]. TOTAL also takes part in numerous regional Committees to provide information to a wide range of stakeholders, including the IAPG (Instituto Argentino del Petróleo y Gas), an institute recognized in Argentina for its high technical standards and whose goal is to ensure that best practices are adopted by industry players and included in the local regulatory framework. In addition, the Group is currently involved in a program that assesses the contribution of its operations to local socioeconomic development.” (Total 2014:200).

“In every country where the Group operates, its Safety Health Environment Quality Charter and its Societal directive, both of which are backed by local legislation, provide a framework for its operations.” (Total 2014:200).

Exxon Mobil also stress that the environment and the health of people are of great importance to the company and that Exxon Mobil have adequate internal systems in place to ensure that their hydraulic fracturing operations are conducted responsibly;

“We manage the risks from our unconventional resources development operations in a responsible manner. We proactively participate in health-related discussions and conduct research to assess potential health risks and whether further management of risk is needed. We have a long history of involvement in health research and a proven record of studying and responding to health concerns associated with our business activities in a responsible fashion.” (Exxon Mobil Corp. 2014:33) (Emphasis added).

“The Operations Integrity Management System calls for analyses of every significant operation ExxonMobil undertakes around the world […]. OIMS enables us to speak with one language on our most important work – protecting people and the environment. (Exxon Mobil Corp. 2014:14) (Emphasis added).

Secondly, much credence is given to the fracking technology itself. The technology is said to be proven safe as it has been used in conventional wells for several decades, in similar ways to its current use (YPF 2013a:8p.). Exxon Mobil describes the hydraulic fracturing process as “a process that’s been safely used by the oil and gas industry for more than 60 years” (Exxon Mobil Corp. 2014:1) (Emphasis added). The reference to the 60 years of hydraulic fracturing experience in the oil industry is also used by Total (see Total 2013:44). The hydraulic fracturing technology is said to be of excellent standards, which provides the operations with the highest safety standards to avoid any environmental risk (YPF 2013a:14). The risk of seismological activity due to fractures in the bedrock is also downplayed while the impact on the land surface is presented as lesser than that of other kinds of energy production, such as solar and wind power (YPF 2013a:14). Exxon Mobil also draws on the small impact on land surface of the unconventional wells, both in comparison to wind and solar power plants as
well as to the land use of conventional oil and gas wells. They base this assessment on a study which found that a 10-well gas pad needed 700 times less land than a wind farm and 450 times less land than a solar park to generate the same amount of energy (Exxon Mobil 2014:8p.).

Thirdly, this frame contains the articulations of use of water and chemical compounds in the hydraulic fracturing process. YPF describes the process as consisting “[…] primarily of injection of water and sand under high pressure into the wells […]” (YPF 2013a:12). In this short capture the use of chemicals is completely left out. In another description, however, the use of chemicals are mentioned and also put in relation to other products in which they might be found; “These additives are used in home products and other commercial appliances: sodium chloride (used in table salt) borate salts (in cosmetics) carbonate potassium (detergent), guar gum (in ice cream), isopropyl alcohol (used in deodorants)” (YPF 2013a:14). Furthermore, the company states that there are no possibilities for the water that is used in the hydraulic fracturing process to be mixed with the fresh water aquifers in Argentina (YPF 2013a).

Moreover, the safe frame of hydraulic fracturing in Argentina allows for a contrasting example between the geological conditions of the Vaca Muerta shale and those of other shale formations – such as the Marcellus shale in the U.S. There are concerns about the possibility of hydraulic fracturing causing environmental degradation in general and contamination of drinking water in particular in the U.S (see Osborn et al. 2011). So by comparing the geological compositions of the Vaca Muerta shale with the geological composition of the Marcellus shale, as well as comparing the freshwater aquifers in the areas, YPF stresses that the Vaca Muerta shale is at a clear environmental advantage compared to the Marcellus shale (YPF 2013a). This comparison effectively distances the company from any generalizations about possible dangers of fracking in other contexts. To increase the impact of this message it is visualized with an illustration (see illustration 1). A geographical aspect is also added to the context-based advantages of the
Vaca Muerta shale formation. YPF points out that the Vaca Muerta shale lies far from all urban centers, in contrast to some places in the U.S where shale developments take place close to densely populated cities (YPF 2013a).

Finally, the possibilities of extracting large quantities of unconventional natural gas are held as positive with regards to the global climate. Natural gas is branded as “the cleanest burning fossil fuel” and this aspect is put in relation to the prospects of decreasing greenhouse gas emissions (see Total 2011:61; Exxon Mobil Corp. 2014:9,27).

7.2. Antagonist Frames

7.2.1. The Socioeconomic Disintegration Frame

In contrast to the protagonist frames (which highlight that the extraction of UFFs should benefit national, regional and local economies, create job opportunities and foster development), this frame stress that the implemented policies in Argentina regarding UFF extraction do not serve the public interest. It also represents the view that regional economies could suffer from a predominant oil and gas sector and that the rights of indigenous communities have been compromised due to drilling projects.

Hydraulic fracturing opponents proclaim that Argentinian oil and gas policies have made unconventional developments lucrative for the oil and gas sector while at the same time undermining the public interest (see OPSur 2012). The partly state-owned company YPF is given part of the blame for this as it is described as having “[…] boosted subsidy programs and secured the increase of wellhead and fuel prices.” (OPSur 2012 cited in FoE Europe 2014:10). Similar claims of policy implementations with skewed economic benefits are also made in regards to a business deal between YPF and Chevron (see FoE Europe 2014:23). The Argentinian Government’s decision to reclaim 51% of YPF is regarded as an indicator that the national government fully supports the expansion of shale gas and tight oil extraction through hydraulic fracturing: “The politics of this decision is clear. […] It has become national policy.” writes CEDHA (2012:6). Furthermore, the oil and gas sector in general are said to have engaged in power politics to gain beneficial terms for their activities at the expense of the public interest. This image is clearly presented through statements such as the following one;

“The oil and gas sector has captured the political debate: Multinational companies have pressured and blackmailed national and regional authorities into making decisions that go against the public interest (increasing the price of gas, the obtention of numerous subsides, tax exemptions, the reduction of percentage
revenues for the government, the anarchic extension of concession terms), arguing that they were necessary conditions to invest in the country.” (FoE Europe 2014:5) (Emphasis added).

“Many industry actors have been pressing for changes in the legal framework regarding UFF development, resulting in measures to make it easier and more profitable for oil and gas companies to develop UFF in Argentina, often at the expense of the public interest and the interest of local communities, workers and the environment.” (FoE Europe 2014:4).

Related to the arguments of skewed economic benefits due to policy implementations are statements which draw clear parallels to the so called “resource curse” (see Collier 2008:39).

Ways of articulating the socioeconomic downsides of the hydraulic fracturing boom are found in claims about how the traditional small-scale farming activities in the Neuquén region have to compete with the increased UFF development (FoE 2014:13). FoE Europe also writes that “[…] the continuous inequalities associated with this industry link the [Neuquén] province with what some call the ‘hydrocarbon curse’” (FoE Europe 2014:14) (Author’s note).

Moreover, the provinces’ lack of leverage and adequate negotiation abilities are also brought into this frame. This is done through statements such as: “small provinces with small budgets were effectively forced to agree with major oil and gas companies.” (FoE Europe 2014:8).

This frame also includes the specific juncture of violations of indigenous communities’ rights. The central issue that is voiced in this regard is that drilling projects have been allowed on territories of indigenous communities, of the Mapuche people in particular, prior to consulting them. FoE Europe writes that “Local legislation has not been matched to international requirements for prior, free and informed consultation with indigenous communities regarding proposed new developments.” (2014:10). Gaining support from indigenous communities for extraction of unconventional resources is portrayed as the responsibility of the Argentinian government, since it has ratified the international convention which guarantees these particular rights (CEDHA 2012).

One of the more commonly pronounced concerns with hydraulic fracturing is that it involves large amounts of water. This problem is mainly framed in a rivalry point of view; the vast use

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6 “The resource curse” generally refers to an economy which is dependent on one resource sector for the main share of its incomes. In short, the main characteristics of the resource curse are that export activities become uncompetitive or unprofitable due to rising value of the domestic currency; local services and foods become more expensive; the economy remain stagnant or does not grow (Collier 2008). The resource curse is usually seen in emerging markets, after the discovery of vast natural resources (Investopedia 2015).
of water in shale developments is said to have the potential to affect both quality and quantity of available water for surrounding communities and other sectors (see CEDHA 2012:16; FoE Europe 2014:4;15). This issue is said to come in particular conflict with the Mapuche people’s livelihood, as it is dependent on water in an already arid environment (FoE Europe 2014:17). However, it is important to note that the Mapuche people are not only portrayed as victims of the oil and gas industry. They are also viewed as strong actors with a significant role in the debate. The mobilization of the Mapuche people is viewed as an important component to the anti-fracking movement, especially in the provinces of Neuquén and Chubut. In the latter province, the Mapuche people are said have stopped fracking wells as a result from claims to their international rights as indigenous people (OPSur 2013).

7.2.2. The Risk Frame

In the pro-fracking “safe frame” it was demonstrated that there is expressed confidence in the national, regional and internal environmental regulations and frameworks. The anti-fracking “risk frame” clearly contrasts that point of view. This frame also contains articulations of health- and environmental impacts of fracking related to air, land and water pollution. Another dimension of the discussion is also added as arguments relating to climate change are brought into this frame.

This frame is characterized by comprehensive critique directed to the Argentinian regulatory system and the lacking influence of public agencies with mandate to regulate and monitor hydraulic fracturing operations (see FoE Europe 2014:33). The ability to perform their work without countervailing interference is put into question (see FoE Europe 2014:5) and on a more general basis, the public sector’s and the Argentine Government’s capability of handling the development of UFF resources is challenged;

“Shale gas offers the Argentine Government a platform upon which to build an energy future, but past political inconsistencies, poor management, and very poor government national policy, have not shown to the Argentine population, the capacity of the public sector to build a vibrant, efficient and lawful energy sector. YPF has been riddled with failure, spills, and inefficiently, which today does not bode well for those concerned that shale gas extraction will bring the same inefficient and poor policy.” (CEDHA 2012:6) (Emphasis added).

“When we look at the experience of industrialized countries like the United States, with fracking, and see the very serious environmental contamination that comes with hydraulic fracturing, we can only be reassured that this impact will come in even worse scenarios in Argentina, where federal and local State environmental controls are weak or non-existent. Today, the intromission of inexperienced high level public officials, into the day to day technical operations of YPF, are proof that Argentina’s new energy policy has been hastily devised
and not strategically oriented on sound foundations. We are concerned that the nationalization of YPF and the bet on fracking is just one more of these overnight policy decisions that will only bring further troubles to an already shaky sector.” (CEDHA 2012:6) (Emphasis added).

The issue of weak regulatory capacity is also emphasized by FoE Europe which claims that environmental regulations have not been properly adapted to the development of UFFs and that no national norm for these regulations exist (FoE Europe 2014:10). They also point to companies which have projects in nature preserves, saying that the companies have used legal vacuums to obtain such concessions (see FoE Europe 2014:5;33). This framing is arguably used to supplement and deepen the impact of the environmental arguments which will be reviewed below. Addressing the issue from the standpoint of insufficient regulatory frameworks does not only function as to further the image of the companies and the national government as being environmentally negligent - it also serves to frame the companies as dubious with respect to the regulations since they are said to exploit legal loopholes et cetera. This could therefore, besides highlighting the dangers of fracking, be an attempt to capture the interest of politicians or legal experts, since specific issues regarding weak regulations and drillings in nature preserves arguably should be addressed by politicians and/or judges of courts, if they are to be adjusted.

Articulations of the environmental risks with fracking are, as previously mentioned, commonly put in relation to the pollution of air, land and water. The notion of air pollution due to the fracturing process contains, for example, references to a study which indicate that toxic compounds can leak during the hydraulic fracturing process and then form ground-level ozone, which is said to have serious negative impacts on human health as well as being harmful to numerous plant species (see CEDHA 2012:18).

The articulation of land pollution risks is commonly interlinked with the description of how flowback water (water that is used in the hydraulic fracturing process and then returned from the well to the surface) is handled. The flowback water is said to be a source of land degradation since it often is stored in open evaporation pits, which can leave toxic residues at the storage site, which in turn is said to generate serious long term land pollution (see CEDHA 2012:18; FoE Europe 2014:4).

Perhaps the most comprehensive and critical articulations of environmental impacts due to hydraulic fracturing are those which emphasize the risk of water contamination (see FoE Europe 2014:22). Such articulations on the topic bring up that fracking fluid (a mixture
commonly composed of around 90% water, 9% sand and 1% chemical additives) can escape into aquifers through naturally existing fractures in the shale; and that the cement casings (which are intended to keep chemicals and gas from entering ground water) surrounding the wells could break due to construction flaws (see CEDHA 2012:16pp.). A likely reason for the significant attention given to environmental aspects (by both pro- and anti-fracking frames) is that they, besides from being seen as important on their own, stand in relation to fears of effects on human health due to fracking activities. The articulations of human health concerns in the “risk frame” are commonly put in relation to environmental pollution, as well as to seismic activity (see CEDHA 2012:15pp.; FoE Europe 2014:4,5,14,22,33).

There are other risk connotations as well, such as: high noise levels and disturbing exhaust fumes at production sites (CEDHA 2012:15); disturbing and/or destructive infrastructure (CEDHA 2012:15; FoE Europe 2014:4,32,40); and expressions of disapproval towards the “secretive processes” which surrounds the drilling operations, especially regarding the types and amounts of chemicals used in hydraulic fracturing wells (FoE Europe 2014:5,33,41p.).

Finally, and on a more general level, this frame voices the concern that hydraulic fracturing of fossil fuels will lead to exacerbated greenhouse gas emissions and hence contribute to climate change. This articulation also entail a conflict between increased investments in fossil fuel extraction and absent investments in renewable energy sources such as wind and solar power (see CEDHA 2012:4pp.; FoE Europe 2014:33,43).

7.3. The Safe Frame vs. The Risk Frame – A Visual Comparison

An interesting contrast is notable through the ways in which images are used to intensify the respective frames. The first picture shown below can be found on YPF’s website under the headline of “Unconventional Resources” (YPF 2014b) (see Illustration 2). The hydraulic fracturing site surrounded by nature and wild animals effectively work to show the production site as safe with regards to the environment. The second picture provides the cover of FoE Europe’s report on fracking in Argentina (2014) (see Illustration 3). They have chosen a picture with openly burning gas flames and black smoke which does not draw attention to safety and environmental concern, but rather to danger and pollution. The negative image is further enhanced by graphics resembling fractures.
Another vivid comparison between how protagonist actors and antagonist actors choose to address the exact same topic becomes visible when looking at charts of chemical compounds. One chart is presented by Exxon Mobil (see Illustration 4) and the other by CEDHA (see Illustration 5). Although the two charts of chemical compounds in fracking fluid are highly similar in respect to the chemicals themselves, the way in which they are presented are highly
dissimilar. Exxon Mobil chooses to relate the chemical compounds to household products and foods in which they are commonly found, an example of “safe framing”. In contrast, CEDHA chooses to present the chemicals in relation to their use in the fracking process.

Illustration 4: Exxon Mobil Corp. (2014).

<table>
<thead>
<tr>
<th>Compound Category</th>
<th>Purpose</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surfactants / wetting agents</td>
<td>Reducing the surface tension of the fluids, Increases viscosity</td>
<td>Isopropanol</td>
</tr>
<tr>
<td>Salt</td>
<td>Creates a brine carrier fluid</td>
<td>Potassium chloride</td>
</tr>
<tr>
<td>Gelator (Gelling Agent)</td>
<td>Improvement of the proppant transport</td>
<td>Guar gum, hydroxyethyl cellulose</td>
</tr>
<tr>
<td>Deposition inhibitors (scale inhibitor)</td>
<td>Preventing the deposition of sparingly soluble precipitates, such as carbonates and sulfates</td>
<td>Ethylene glycol</td>
</tr>
<tr>
<td>pH regulators and buffers (pH control)</td>
<td>Maintains effectiveness of other components</td>
<td>Sodium or potassium carbonate</td>
</tr>
<tr>
<td>Chain Breaker (Breaker)</td>
<td>Reducing the viscosity of gel-containing Frack fluids to deposit the proppant</td>
<td>Ammonium persulfate</td>
</tr>
<tr>
<td>Crosslinker</td>
<td>Maintains fluid viscosity with temperature increases</td>
<td>Borate salts</td>
</tr>
<tr>
<td>Iron precipitation control (Iron Control)</td>
<td>Prevention of iron oxide precipitates</td>
<td>Citric acid</td>
</tr>
<tr>
<td>Corrosion inhibitor</td>
<td>Prevents pipe corrosion</td>
<td>n,n-dimethyl formamide</td>
</tr>
<tr>
<td>Bicidcal</td>
<td>Prevention of bacterial growth, prevention of biofilm, preventing formation of hydrogen sulfide by sulfate-reducing bacteria</td>
<td>Glutaraldehyde</td>
</tr>
<tr>
<td>Acids</td>
<td>Preparation and cleaning of the perforated portions of the drilling mud and cement, resolution of acid-soluble minerals</td>
<td>Hydrochloric acid or muriatic acid</td>
</tr>
<tr>
<td>Friction reducer (slickwater additives)</td>
<td>Reducing friction within the Frack Fluids, Allows fracking fluid to be pumped at faster rates and lower pressures</td>
<td>Polyacrylamide, mineral oil</td>
</tr>
<tr>
<td>Oxygen scavenger</td>
<td>Removes oxygen to protect from corrosion</td>
<td>Ammonium bisulfate</td>
</tr>
<tr>
<td>Support means (proppant)</td>
<td>Drops the fractures open to allow the gas to escape</td>
<td>Silica, quartz sand</td>
</tr>
<tr>
<td>High temperature stabilizer (Temperature Stabilizer)</td>
<td>Prevention of premature decomposition of the gel at a high temperature in the target horizon</td>
<td></td>
</tr>
<tr>
<td>Solvent</td>
<td>Improving the solubility of the additives</td>
<td></td>
</tr>
<tr>
<td>Foams (Foam)</td>
<td>Support of the proppant transport</td>
<td></td>
</tr>
<tr>
<td>Hydrogen sulfide scavenger (H,S Scavenger)</td>
<td>Removal of hydrogen sulphide to prevent system corrosion</td>
<td></td>
</tr>
<tr>
<td>Clay stabilizers</td>
<td>Reduce swelling and displacement of clays</td>
<td></td>
</tr>
</tbody>
</table>

Illustration 5: CEDHA (2012).
This type of presentation keeps the chemicals related to their industrial purpose and provide much less room for feeling safe regarding them, since fewer parallels can be drawn to familiar and safe reference points.

8. Conclusions

The purpose of this thesis was to analyze arguments and expressions for and against the use of hydraulic fracturing in Argentina, in relation to actors and frames. Due to newly found interest in the great potential of the Vaca Muerta shale in particular, this topic has become subject to hot debate. Unconventional resource extraction is only in its early phase in Argentina, but this thesis has shown that actors in the debate already draw on vividly different connotations, uses arguments in distinct ways to make their cases, and construct different problem formulations to legitimize their sakes.

The answer to the research question – “How is opposition against and support for hydraulic fracturing in Argentina expressed in texts and images by six actors with clear stands regarding the impacts of the practice?” – can be derived from the analysis as the most prominent expressions of support and opposition were embedded in the four frames.

Through The Socioeconomic Development frame it became clear that actors who support fracking stress three positive factors in particular, namely; energy security, energy self-sufficiency, and economic growth. These three aspects were frequently put in relation to hydraulic fracturing in general and to the development of the Vaca Muerta shale in particular. Moreover, the economic growth was often expressed in terms of local businesses and development of regional economies.

In contrast, the actors who oppose fracking mainly stressed three negative factors in The Socioeconomic Disintegration Frame. These factors were; implemented policies do not serve the public interest, regional economies could suffer, and that the rights of indigenous communities have been compromised.

As for the environmental and health concerns, they were embedded in both texts and images in both The Safe Frame and The Risk Frame.

To start with, the protagonist actors of The Safe Frame declared that there are sufficient regulations in place for the hydraulic fracturing operations to be regarded as safe. Secondly, the technology was emphasized as proven safe through decades of experience. Thirdly, the
use of water and chemical compounds was expressed as safe in relation to health and the environment. As for context-based advantages in relation to other shale formations, the geological conditions of the Vaca Muerta shale was also said to be favorable and the same was said for its geographical location. Finally, shale gas was declared to be positive with regards to lowered greenhouse gas emissions in comparison to effects of other fuels on the climate.

A remarkable conclusion following the analysis is that the formulations for and against hydraulic fracturing in large part derives from the same starting-points. Instead of spawning from different sources, the main topics at hand are largely the same, albeit reversed with regard to their contents.

The four most significant frames found in this study concerned positive and negative socio-economic impacts, the safety and the risks associated with hydraulic fracturing projects. These frames were in large part mirrored; they contained highly similar issues but were framed with positive connotations by the oil and gas companies and negative connotations by the environmental- and anti-fracking organizations. Prominent examples of such mirrored topics were the impacts on local economies, the local environment and the global climate. Another topic which proved to be a striking matter of dispute was the ways in which protagonist and antagonist actors referred to regulations and monitoring, or in the case of the antagonist frame, the inadequate practices or lack of them.

The protagonist and antagonist frames effectively took shape through construction of different problem formulations and emphasis on different aspects of the same topics. This indicates several things. Firstly, it implies that the actors who express these views are well aware of the articulations used by their adversaries and are well prepared to face them with counter-articulations on the same topic. Secondly, it implies that constructions of problem formulation are mutually reinforced. Although it is not possible to confirm any causal relations through this study, such as affirming that the contents of the debate are the direct results of specific factors or processes, there are strong indications in place which imply that both the antagonist and the protagonist frames play part in the construction of the fracking discourse in Argentina. For instance, this was indicated in the ways that protagonist and antagonist frames dealt with the topics of safety versus risk, development versus disintegration, and regulation versus lack of controls. As mentioned in the introduction of this thesis, the intention was not to make any validations of the levels of truth to specific claims in the frames. The “actual” or “real”
advantages and disadvantages of hydraulic fracturing in Argentina thus remains unidentified in this study. Instead, the results from this thesis imply that both protagonist and antagonist frames, and the actors who give them a voice, relate to each other as they highlight benefits and downsides of fracking. The ways in which one side addresses issues seemingly oblige adversary actors to respond in a certain way, and thus, the discourse is arguably mutually constructed and reinforced by both sides. The frames are plausibly central here. Their socially constructed meaning give them importance, whether the frames’ contents are true or false. They are central due to the ways in which actors relate to them when they express themselves and argue for and against fracking. This has further implications as well. Even though there are nationally adopted policies in Argentina which promotes the extraction of UFFs, it does not seem to be the case that the fracking protagonists exclusively have obtained the interpretative prerogative on the topic, or a monopoly on the problem formulations. Even though the notion of energy self-sufficiency has gained an institutionalized status through legislations in Argentina, the ways in which the protagonist actors strive to achieve that notion is constantly put in question.
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Appendix