# Why implement plug-in electric vehicle policies? Comparing policy discourse in newspapers across three Canadian provinces (2008-2018)

by

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# Abstract

Governments can implement a wide range of policies to increase the uptake of plug-in electric vehicles (PEVs). For example, regions differ in their focus on demand-focused policies that encourage consumers to purchase a PEV, versus supply-focused policies that encourage the industry to develop or sell PEVs. I explore how policy discourse, or how language is used to create meaning around policy issues, can shed light on policy implementation in the Canadian provinces of British Columbia, Ontario, and Québec during the decade 2008-2018. In Canada, Québec became the first to use supply-focused policy, while British Columbia and Ontario relied on demand-focused policies. Using a selection of 984 newspaper articles, I adopt a mixed-method approach to analyze statements from governments and other actors. First, I conduct (quantitative) content analysis and analyze the frequencies of frames (selected aspects of reality) around PEVs and policies. Second, I conduct (qualitative) discourse analysis by investigating how frames unite to create meaning in simplified stories, storylines. Similar frames occurred in all three case studies: governments framed PEV policy to meet climate goals while emphasizing PEVs' private benefits to consumers. Policy discourses differed by regions: Québec's emphasized PEVs as part of economic independence; Ontario's demonstrated more policy controversy; and British Columbia's remained silent over supply-focused policies during the time period. In British Columbia and Québec, the automobile industry favored a demand-focused policy approach. While this study remains exploratory, analyzing and comparing policy discourses can shed light on why policymakers in different regions may gravitate towards different policy approaches over time.

**Keywords**: plug-in electric vehicle; electric vehicle policy; policy discourse; policy implementation; frames; media analysis

# Acknowledgements

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# Chapter 1.

# Introduction

Many governments are implementing policies to enhance the uptake of plug-in electric vehicles (PEVs) to reduce environmental impacts and greenhouse gas emissions (GHGs) from personal transportation. In this study, I define PEVs as vehicles that use an external source of electricity to power the wheels (solely, or in combination with another energy source, such as gasoline). There is a wide range of PEV-focused policies, and regions differ not only in their policy approach but also in their discourse around policy. Here, I categorize PEV policies between two approaches: demand-focused policies that directly support or encourage consumers to purchase a PEV such as a financial incentive, and supply-focused policies that encourage or require suppliers, such as the automobile industry, to develop and sell PEVs through sales or vehicle requirements (Axsen et al., 2016). Notably, policymakers in some regions tend to rely on demand-focused policies, while others use more supply-focused policies.

In this study, I compare the PEV policy discourses of three Canadian provinces: British Columbia (BC), Ontario, and Québec. In the first half of 2020, 93% of new PEV sales in Canada occurred in these regions (Statistic Canada, 2021). All three have been leaders in climate and PEV policy implementation but adopted different policy approaches (Melton et al., 2017). During the study period (2008-2018), Québec became the first province to use supply-focused policy for PEVs with the introduction of a ZEV mandate in 2016 that require automakers to sell a percentage of PEV each year. In contrast, the two other provinces continued to rely on demand-focused policies such as financial incentives that lowers the cost of owning a PEV.

This study aims to shed light on PEV policy implementation by exploring discourse around policy. Policy implementation is complex and non-linear and can be continually influenced by language and debate. Hence, analyzing policy discourse is one way to better understand the policymaking process by providing insights into *how* (the language used) and *why* (the reasons) regions adopt different approaches to PEV policy. I define policy discourses as dynamic linguistic interactions in which actors debate and represent a position that assigns meaning to a policy issue. Analyzing and comparing the policy

discourses across these case studies can shed light on why policymakers in different regions may gravitate towards different policy approaches, at different times. Further, the analysis of discourse is interested with the meaning behind policy issues, which can help explore different policy pathways.

The way policies are designed and framed is always influenced by a context composed of interest groups, ideologies, and established values and practices (Brown, 2001; Rein et al., 2012). Arguably, governments implement policies and act as a dominant actor in the formation of policy discourse, though I also examine how other actors challenged or maintained the PEV policy discourse of a region. Actors with interests in low-carbon innovations can play different roles in influencing policy decisions, influencing the establishment of needed institutions, and increasing consumer demand for the technology (Stephens et al., 2008). In this study, I examine the socio-political context in which government and actors debate to help understand the interconnected factors that can facilitate or thwart successful technology and policy development as well as policy discourse (Stephens et al., 2008; Vergis, 2014). The socio-political contexts of BC, Ontario, and Québec are detailed in Section 1.4. where I draw from the Socio-Political Evaluation of Energy Deployment (SPEED) framework that analyzes regional energy technology deployment (Stephens et al., 2008). I adapted the SPEED framework to PEV policy implementation and applied it to the three case studies.

I use policy discourse as the broad concept to depict the debate of meaning using language (specifically, how governments and other actors create meaning around PEVs and PEV policy and act upon them). In this study, I focus on public policy discourse, rather than individual or interpersonal discourse that occurs at the personal level or between individuals (Rein & Schon, 1991). My analysis also uses the concepts of framing, storylines, and discourse coalitions (defined further in Section 1.1). These concepts are theoretical tools to examine the "language-in-use" around complex and technical notions (Wetherell et al., 2001). First, I use the concept of framing to categorize and analyze how technology and policies are portrayed over time. Framing uses selected aspects of reality, frames, to represent issues in a certain way while other aspects are dismissed. In policy making, framing includes different views of the world and provides many directions for action that can result in political controversies over an issue (Rein & Schon, 1991). In Section 1.2., I present the PEV private-societal

framework that categorizes the different frames that can be perceived and associated with PEVs. Second, I use the concept of storyline to detect how actors combine frames to tell a simplified story of reality. Storylines are dynamic and essential components of policy discourse, which can integrate several storylines that oppose or complement one another. Third, I use the concept of discourse coalition. I draw from the work of Hajer (1995) to define discourse coalition as a group of actors that can have distinct interests yet share a common understanding of a social issue. Therefore, understanding the policy discourse for each case study draws from the concepts of framing, storylines, and discourse coalition.

My analysis also draws from the work of Brown (2001) to further explore the role of discourse and framing in the policymaking process and shed light on the reasons behind the implementation of PEV policies. In his study, Brown investigates how the reshaping of the Californian Zero Emission Vehicle (ZEV) program, which requires car companies to sell a minimum market share of electric vehicles, changed the framing of PEV technology. Initially, the design of the ZEV program framed PEVs as a good with many societal attributes such as environmental benefits (societal framing). However, the reshaping of the ZEV program by the California Air Resource Board (CARB) resulted in a framing focused on private attributes such as range and cost (private framing). Inspired by Brown, I designed this study to analyze and compare the role that governments can play in the shaping and promotion of technology in policymaking (Brown, 2001). In contrast to Brown, I examine the implementation and discourse of a wider range of PEV policies by governments and other actors across three case studies.

I use newspaper coverage to retrieve statements from governments and other actors, analyze frames and storylines, and identify which actor supports or opposes these storylines through possible discourse coalitions. I chose to analyze statements retrieved in newspapers given that newspapers act as a policy forum that institutionalizes policy debate and reflect the interplay of storylines (and potential discourse coalitions) in a particular context (Rein & Schon, 1991). To examine these statements, I apply a mixed-method approach that integrates a quantitative content analysis and qualitative discourse analysis (Sovacool, Axsen, et al., 2018). I chose to integrate methods sequentially by first performing the content analysis, which then informed and guided the discourse analysis. Content analysis focuses on frequencies of textual features such as words or categories. This method is limited to a descriptive

analysis of *what* is said rather than *how* it is said. Hence, to analyze the meaning behind *what* is said, discourse analysis focuses on the interpretative examination of the argumentative structure in documents and other written or spoken statements (Hajer, 2002). Adopting a mixed-method approach can help integrate distinct research outcomes towards an in-depth analysis of complex social issues such as transportation policy.

While the analysis of discourse can take many forms, I chose to analyze statements from governments and other actors retrieved from newspaper coverage rather than documents (e.g., policy documents, press releases, reports, etc.). First, analyzing statements retrieved in newspapers provides insights into which actors may be involved with PEV and policy development over a time period (as mediated by the media) (Stephens et al., 2008), the competing interests, and the PEV context of a region. Specifically, analyzing newspapers and mediated statements can be useful to identify potential discourse coalitions. Second, newspapers provide a social perspective of discourse that reflects the public debates around policy and the context in which they occur, rather than a descriptive and often technical discourse retrieved from documents produced by actors themselves. In addition, (mediated) statements can be perceived as an argumentative form of discourse given that they aim to synthesize, promote, and debate for a specific policy discourse. Therefore, newspapers act as a "site of argumentation" (Runhaar et al., 2006) in which many actors compete to promote their perceptions on an issue. Thus, analyzing policy discourse through the lens of the media reflects the dynamic interplay of policy interests in a given context.

To my knowledge, few studies have studied the framing of PEVs and PEV policies through discourse. While some studies have explored storylines and discourses of energy policy in BC (Dusyk, 2016) and Ontario (Mang-Benza et al., 2020), no study has explored PEV policy discourse specifically. Brown (2001) conducted a qualitative examination of CARB's framing of the Californian ZEV mandate by investigating statements from documents and interviews, but his study mostly assessed CARB's framing of a single PEV policy. Moreover, only two studies conducted quantitative assessments of the framing of PEV technology in the American media (Melton et al., 2016; Pollak et al., 2006). Additionally, Buddle et al., (2015) explored the automobile industry's framing of early PEV technology development (1990-2009) while others analyzed the position of manufacturers and industry coalitions towards the Californian

ZEV mandate (Fogelberg, 2000; Wesseling et al., 2014). However, these studies focused on the United States as a case study and did not examine the discourse of recent PEV technology (such as battery-electric vehicles, BEVs, that only use electricity) or policies other than the Californian ZEV mandate. Finally, many studies have provided descriptive and qualitative observations of PEV and policy deployment in different regions such as California (Calef et al., 2007a; Stokes et al., 2018), Norway (Figenbaum et al., 2015), British Columbia (Harrison, 2012; Murray et al., 2015), Québec (Haley, 2015), and France (Calef et al., 2007b). However, these studies did not examine how different PEV policy approaches have been framed by various actors, at different times, and across many regions.

The design of this study is novel in three ways. First, it will improve the literature by shedding light on PEV policy implementation through the lens of discourse. Specifically, this is the first study to examine the discourses of various PEV policies using the concepts of frames, storylines, and discourse coalition, and one of the few that uses these discourses to shed light on policy implementation across regions. Additionally, while most of the studies analyzed only one actor category (government or the automobile industry), this study explores how various actor categories have framed PEV policies during the decade 2008-2018. Second, my research is the first to analyze and compare PEV policy implementation of BC, Ontario, and Québec. Third, the studies outlined above mostly used descriptive observations or a single method for media analysis. My study will add to the literature using a mixed-method approach integrating both quantitative and qualitative analyses. Adopting a mixed-method approach provides not only frequencies and comparable results across case studies but also a thorough understanding of the meaning behind these results. Nevertheless, this research adopts an exploratory lens and does not imply causality between policy discourse and policy change but argues that examining PEV policy discourse can be useful in discussions about a transition to sustainable transportation systems.

Given that I rely on statements retrieved from newspapers to analyze discourse, the policy discourses presented in this study have a mediated nature. In other words, the statements analyzed must have been filtered to comply with media practices and norms (Shoemaker et al., 1996). Additionally, the concentration of media ownership in Canada might influence the quality of news coverage given that the range of voices included in political news coverage is limited (Blidook, 2009). For instance, the media conglomerate

Postmedia owns The Vancouver Sun, The Province, and the Toronto Sun (all selected for this study) and is known to have "ideological sympathies with the oil industry" (Dusyk, Axsen, & Dullemond, 2018, p.15). Thus, this study does not imply that the storylines and discourses identified are dominant, nor that they are the only ones that were advocated during the study period. The limitations of this study are discussed in Chapter 5.

The remainder of this chapter explains my conceptual framework as well as the PEV private-societal framework, then summarizes previous research and sets up the research gaps this study aims to fill before outlining my specific research questions, objectives, and expectations.

## 1.1. Conceptual framework: discourse, framing, and storylines

The theory behind the analysis of discourse in politics argues that policymaking is a complicated, non-linear process that is constantly influenced by language and debate (Fischer, 2003). Discourse is the central conceptual lens used in this study and as mentioned above, I define it as language-in-use promoted by actors that interact and debate around the meaning of technology and policy issues (Hajer, 1995; Wetherell et al., 2001). By producing or reproducing meaning, concepts and perceptions of policy can change over time. Analyzing discourse helps reveal the meaning behind policy, which can influence policy (and technology) legitimacy and development. As mentioned earlier, I focus on the public perspective of policy discourse (Rein & Schon, 1991). Thus, analyzing policy discourse through newspaper provides a window into the social aspect of discourse in policymaking. Using statements as a unit of analysis also helps to analyze the argumentative form of discourse, which characterizes policy discourses. Hence, I guide my analysis of discourse on the concepts of framing (and frames), storyline, and discourse coalition, which are not mutually exclusive and described next.

The first conceptual lens I use is the concept of framing that manifests the structure of *how* technology and policy issues are presented. Framing involves the use of frames that are selected aspects of reality intentionally emphasized (or not) by actors to promote a particular definition, interpretation, or evaluation of an issue (Entman, 1993). For instance, PEVs can be portrayed as requiring less maintenance (good for consumers), but inversely they can also be portrayed as a threat to the automobile

service industry (bad for workers). In the PEV private-societal framework, I categorized different frames from which PEVs can be perceived and defined.

Given that governments adopt and apply frames to define policy issues and make decisions (Nisbet, 2009), framing is also used to analyze statements about PEV policies. Framing (and frames) in discourses around policy reflects the structures of belief, perception, and underlying policy positions. Complex issues such as technology can be framed in ways to construct the problem of a specific policy situation (Shön, D. A., & Rein, 1994). Specifically, in the content analysis, I analyze how PEV policies are framed based on the tone of the statements: positive, negative, or neutral/mixed. A statement that is either mentioning both positive and negative frames that are of similar magnitude is mixed while a statement that does not specifically promote a positive or negative framing is neutral. For the purposes of this study, both types of statements are referred to as "neutral" in this paper. Therefore, I use the broader concept of framing throughout this study but explore frequencies of PEV frames and policy frames in the quantitative content media analysis.

The second conceptual lens I apply in this study is the use of storylines. A storyline is a condensed statement in which perceptions and interests are translated into frames that are assembled to present a simplified narrative (Hajer, 1995; 2002). For example, a storyline could focus on the lower driving range of PEVs compared with conventional gasoline cars to advocate for investment in charging stations. This example illustrates how frames of PEVs and policy can be unified into storylines that simplify complex notions such as technology and policy. Storylines can make use of visual representations, metaphors, or other linguistic tools to illustrate interests or even attribute responsibility to a specific actor. Moreover, new storylines can emerge and re-organize how PEVs and PEV policies are framed, which can maintain or challenge policy discourses (Hajer, 1995). I use the concept of storyline in the discourse analysis to summarize the meaning behind statements from governments and other actors.

I also use the concept of discourse coalition in my analysis of PEV policy discourse. A discourse coalition is characterized by a set of storylines, the actors that articulate these storylines, and the practices in which the storylines are expressed (Hajer, 1995). The interplay between interests, actors, and storylines can result in the formation of groups of actors gathering around a common understanding in which their interests are

interconnected. This shared understanding captures how problems are framed and their necessary solutions (Rafey, W., & Sovacool, 2011). In this study, I explore potential discourse coalitions in the PEV policy discourse of BC, Ontario, and Québec. To that end, I investigate which actors support the government's storyline and which actors promote a different storyline of PEVs and PEV policy.

## 1.2. The PEV private-societal framework

To define and classify the different frames that can be emphasized when representing PEVs in a storyline, I created the PEV private-societal framework in Table 1. This framework is inspired by two approaches of PEV perceptions. First, the private-societal perspective draws from the distinction between the private and public framing of PEV technology and the PEV definition of "mixed private-public good" used by others (Axsen et al., 2012; Brown, 2001; Green, 1992). Second, this framework categorizes PEV frames into nine categories inspired by the work of Axsen and Kurani (2012). In this study, the PEV private-societal framework guides the content media analysis to identify which PEV frames or frame categories are most mentioned by governments and actors. Next, I explain the inspirations of the framework before detailing the categories of frames outlined in Table 1.

**Table 1.** **PEV private-societal framework (with illustrative examples)**

| Categories of frames | Positive | Negative |
|---|---|---|
| **Private** | | |
| **Financial** | Save money on fuel and from low maintenance | Carry a high up-front cost and battery change cost |
| **Performance** | Reliable and durable electronic components, great durability, energy efficient, quiet motor | Short range, short battery life and poor performance, concerns associated with a quiet motor |
| **Convenience** | Less maintenance, fewer trips to to gas stations, convenient charging time and infrastructure, ease with charging applications on smartphone | Inconvenient charging time and infrastructure, few models or color options, limited space due to cargo space |
| **Identity** | Positive perceptions of style and status, emotions positively linked to driving and owning a PEV | Negative perceptions of style and status, emotions negatively linked to driving and owning a PEV |
| **Others** | Inspire others, environmental advocacy, comfort | Do not suit lifestyle, not for everyone, not comfortable |
| **Societal** | | |
| **Environmental** | Contribute to climate change mitigation, cuts air pollution, reduce fossil fuel independence | Use material that impact the environment, source of electricity used might increase pollution |
| **Economic** | Bring economic and market opportunity, job creation | Bring economic burden (e.g., investment needed), no market opportunity |
| **Innovation** | Support research and technology development, challenge incumbent technology, enhance innovative transition | Competition with larger players and with internal combustion engine (ICE), societal uncertainties about the technology and its impacts, burden for production |
| **Others** | Position a region as a leader in innovation, result in health benefits, increase energy security and diversification, reduce of oil dependency, perceived as a pivot for social change | Require a reorganization of energy mix and use, increases the number of cars on the road (increase congestion and infrastructure maintenance), put pressure on the electricity system |

The first inspiration of the PEV private-societal framework relies on the definition of PEVs as a "mixed private-public" good (in this study, private-societal) (Brown, 2001). A private good is characterized by exclusive consumption and payment whereas a public good is characterized by nonexclusive consumption and payment while also being associated with welfare (Green, 1992; Philip et al., 2019). A PEV is primarily considered a private good as it is paid and consumed by individuals, but it also possesses public good qualities because it can increase welfare by decreasing GHG emissions, air pollution, and noise pollution among others. A combination of these private and social characteristics results in a mixed private-societal good (Green, 1992; Philip et al., 2019). Therefore, the PEV private-societal framework divides frames of PEVs between "private" and "societal" categories, as shown in Table 1.

The second inspiration is drawing from the work of Axsen and Kurani (2012) that conceptualized consumer perceptions of the benefits of plug-in hybrid electric vehicles (PHEVs) into two dimensions: functional-symbolic and private-societal. I adapted their conceptual framework by adding the perceived drawbacks associated with PEVs along with all the possible PEV attributes that are not exclusively from the consumers' perceptive. These additional attributes were retrieved from a preliminary assessment of 78 newspaper articles to capture a wide range of PEV perceptions. Following this exercise, I adapted the work of Axsen and Kurani into the final nine categories of frames that are divided between private frames classified into five categories (i.e., financial, performance, convenience, identity, and others) and societal frames that are classified into four categories (i.e., environmental, economic, innovation, and others).

The private categories regroup attributes related to the cost, performance, and convenience of PEV technology as well as other attributes valued by consumers such as the emotions, status, and comfort associated with a vehicle. As mentioned above, these private attributes can be perceived as benefits or drawbacks. As benefits, PEVs can save money and time, require less maintenance, and have a symbolic value (positive or negative) to consumers (Axsen et al., 2012; Kumar, R. R., & Alok, 2020). Often compared to gasoline vehicles, PEVs can also be perceived as a risky technology with several disadvantages for consumers such as a shorter driving range, high upfront purchase price, less style, and the inconvenience of recharging the battery.

The societal categories regroup attributes associated with the societal impacts of PEVs such as environmental and economic impacts, societal changes with regards to technological innovation, and other broader impacts on the transportation and energy systems. Aside from environmental benefits, PEVs can be perceived as challenging incumbent industries such as the fossil fuel industry (Skjølsvold & Ryghaug, 2020), foster regional economic activity (Axsen et al., 2012; Qiao et al., 2019), and transform the culture of transportation (Skjølsvold & Ryghaug, 2020). Inversely, PEVs can also have negative environmental impacts regarding waste disposal and battery production (EEA, 2018; Xiong et al., 2020). Moreover, PEVs can also increase congestion by adding more vehicles on the roads and exert pressure on the energy system by requiring accessible, sufficient, and continuous electricity (EEA, 2018; Nour et al., 2013).

## 1.3. Literature review

In this section, I review relevant research exploring PEV policy implementation and studies that assessed the role of framing and discourse in policy decision-making. First, I review research that explores potential explanations of PEV development in leading regions followed by energy policy studies that explore the role of discourse in policy implementation in British Columbia and Ontario. Second, I review studies that investigate the framing and discourse of various alternative fuel technologies using mostly quantitative research methods. Third, I review the work of Brown (2001) that examines PEV policy implementation in California using qualitative analysis. Fourth, I review studies that look at the automobile industry's discourse of PEV technology and the Californian ZEV mandate. Finally, I highlight the research gaps related to PEV policy research and position the novelty of my study. Specifically, this study is the first study to analyze and compare the PEV policy discourse in British Columbia, Ontario, and Québec using a mix of quantitative and qualitative research methods. Moreover, it is the first study to integrate the concepts of framing, storyline, and discourse coalition to assess how different actors across regions framed various PEV policies in the decade 2008-2018.

Many PEV studies explored the potential explanations behind a PEV transition in leading regions looking at different influential factors such as policy. A study by Figenbaum (2015) explored BEVs' deployment in Norway by investigating several influential factors such as citizens' perceptions, how information about the technology

was effectively diffused, and which policies facilitated the transition (Figenbaum et al., 2015). Another study using Québec as a case study argued that established hydropower institutions played an important role in promoting political legitimacy and enhancing early innovation processes with regards to PEV technology (Haley, 2015). In the United States, Stokes et al. (2018) compared the role of state and national governance in the implementation of PEV policy. They found that the design and implementation of electric vehicle policy share similarities with energy technology policy (Stokes et al., 2018). Another study compared the PEV policy approaches between California, which focused on supply-focused policies, and France, focused on demand-focused policies (Calef et al., 2007b). The authors claim that both regions increased PEV uptake but policies in California required more participation from other actors and spurred interests in PEV technology more effectively than in France. These studies explored the development of PEV technology and policy by mostly describing the regional history regarding PEVs and the different socio-political influences that helped legitimize PEV technology and policies in these regions. However, these studies did not study the role of discourse and storylines from actors in the implementation of PEV-supporting policies.

In Canada, studies have explored discourse and implementation of energy policy in British Columbia (Dusyk, 2016; Harrison, 2012; Murray et al., 2015) and Ontario (Mang-Benza et al., 2020). Dusyk (2016) analyzed the BC discourse around energy policy with a focus on the post-2007 clean energy storyline put forth by the government. At first, the clean energy storyline promoted a climate rationale, but as the storyline was adopted and established, it became a tool to justify large hydroelectricity and natural gas projects. Over time, the storyline was repurposed to work against climate policy rather than supporting it. Other studies examined the implementation of the BC carbon tax, which surged economic concerns and was opposed by the New Democratic Party (NPD) through the "Axe the tax campaign". However, the carbon tax was successfully implemented in 2008 in part due to the public's trust in the government (at that time, the Liberal party), the prevalence of hydropower, and voters' interest in climate change (Harrison, 2012; Murray et al., 2015). Similarly, another study from Mang-Benza et al. (2020) looked at the government discourse surrounding the energy transition in Ontario between 2009 and 2019 to investigate why the discourse around energy policy transitioned from supporting to halting clean energy projects. They found a first discourse (2009-2013) that emphasized clean energy, green economy, and air quality

while a second discourse (2014-2018) positioned climate change as a "real" challenge. They found a different, third discourse (July 2018-2019) that claimed to address climate change while fighting "skyrocketing energy costs" and "the job-killing carbon tax" (Mang-Benza et al., 2020). While not specifically considering PEVs or statements from other actors, these studies provide relevant insights on PEV policy implementation and policy discourses in BC and Ontario between 2007 and 2019.

To my knowledge, only two studies have looked at the framing of alternative fuel vehicle technology and both relied on quantitative content analysis of media coverage. First, a study by Pollak et al. (2006) conducted an analysis of 153 United States (US) newspaper articles to analyze the framing of hybrid electric vehicles (HEVs), that is, vehicles combining a conventional internal combustion engine with an electric propulsion system. The authors compared the frequency of attributes mentioned in newspaper coverage (2002-2003) with a consumer survey and found that in the media, environmental attributes were more mentioned than other private attributes. They recommended that HEV media coverage should align with consumers' interests thus should be focused on HEVs' reliability, safety, and performance rather than environmental benefits (Pollak et al., 2006). A second study conducted by Melton et al. (2016) assessed media attention in the US (1980-2013) for several alternative fuel technologies. The authors found that media coverage of PEVs (including BEVs and PHEVs) after 2010 was mostly negative and emphasized the high vehicle cost, low sales, and technical accidents involving PEVs. Findings from both studies suggest that (US) media coverage of PEV technology varied by time period and by technology (HEVs or PEVs). These two studies provide some insights on the framing of PEV technology between 1980 and 2013 but focused on quantitative analysis of newspaper coverage without pursuing an in-depth qualitative analysis. Moreover, apart from Melton et al.'s (2016) study that included some statements from actors about PEVs, both studies did not analyze statements focused on PEV policies.

One study provided a more in-depth, qualitative perspective on the framing of PEV technology and policy implementation. Specifically, Brown (2001) explored CARB's framing of electric vehicle technology in the Californian ZEV program mostly by analyzing government documents. In the first phase of the ZEV program (1990-1996), CARB emphasized a framing of PEVs around societal environmental benefits (in this study, I use PEVs) This initial shaping of the ZEV program implied that the government

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wanted consumers to change their preferences to voluntarily purchase a ZEV. However, the 1996 reshaping of the program resulted in a framing that emphasized ZEVs as needing to satisfy consumer demand driven, specifically in terms of cost and performance, rather framing ZEVs than a good driven by environmental stewardship. Thus, the second phase of the ZEV program (1996 onwards) framed the technology as another private mode of transportation that needs to meet the interests of consumers. Consequently, this new framing did not require consumers to change their preferences or values regarding PEVs. In his study, Brown recognizes that the 1996 revision was the result of various political and ideological pressures but argues that the PEV transition would have been more successful if the initial societal framing of PEVs remained. Through his qualitative observations, Brown aimed to understand the potential explanations behind the revision of the ZEV program using quotes and government documents yet did not specifically use the concepts of discourse, framing, nor storyline in his analysis. Moreover, Brown did not study the framing of other PEV policies and did not explore in-depth the framing from other actors.

Some studies have also looked at the automobile industry's perspective regarding PEV technology and policy. A study by Budde et al. (2015) applied a mix of qualitative and quantitative methods to assess the relationship between discourse and innovation activities of the automobile industry regarding HEVs and fuel cell vehicle technology from 1990 to 2009. They found that car manufacturers stated many positive statements of fuel cell technology before its market introduction to raise awareness and mobilize other actors. Contrarily, car manufacturers developing HEVs had no incentives to create attention or positive expectations of HEVs before their market introduction and portrayed HEV technology as just one option among others (Budde et al., 2015).

During the same timeframe (1990s onwards), Fogelberg (2000) found that the industry promoted anti-electric car campaigns in the media to oppose the Californian ZEV mandate while non-governmental organizations (NGOs) were supportive of the policy. This opposition is also highlighted by Brown (2001), which stated that industry opponents during the 1990s argued that such policy would "constitute a drag on the California economy" (Brown, 2001). Another study by Wesseling et al. (2014) analyzed various governmental documents to explore how car manufacturers (individually) and their political coalitions (collectively, such as automobile associations) changed their position between 2000 and 2013 in response to the Californian ZEV mandate. They

found that, while some car manufacturers still framed PEVs as "technologically immature" and "not yet market-ready", they became less opposed to the policy over time and more proactive and compliant in their strategy. In contrast, they found that coalitions remained defensive towards the policy, which suggests that car manufacturers used industry associations to continue opposing the policy (Wesseling et al., 2014). While providing insights on the discourse from the automobile industry regarding electric vehicle technology (from 1990 to 2013) and the Californian ZEV mandate, these studies focused on the United States and did not examine the discourse of other PEV policies after 2013.

The above literature highlights important research gaps that this study aims to fill. First, most of the studies outlined above do not explore the role of discourse in PEV policymaking using the concepts of storylines and discourse coalitions. While some analyzed discourse, they focus on a single policy (mostly the Californian ZEV mandate) a specific actor category (governments or the automobile industry). Additionally, studies applying the concept of framing mostly focused on early electric vehicle technology (before 2013) such as HEVs without analyzing frames of policies (Melton et al., 2016; Pollak et al., 2006). Second, the literature reviewed here mostly focused on a single case study (one region). Specifically, no study compared the PEV policy discourses between the Canadian provinces of BC, Ontario, and Québec. Third, most research on PEV policy deployment lacks the integration of different research methods or designs. Research has mostly focused on descriptive analyses of PEV and policy deployment, discourse analysis from communication documents, and single method to media analyses. Given the time period (2008-2018) used in this study, the multiple actor categories, and the comparative case studies, this study differs from conventional discourse analysis, which usually focuses on document analysis. Hence, my research design is novel in its approach (mixed-method analysis of mediated statements) and scope (analysis of various actors, in different regions, at different times). Therefore, this study aims to provide empirical and comparable evidence that sheds light on the role of discourse in PEV policy implementation.

## 1.4.  Socio-political contexts of the case studies: British Columbia, Ontario, and Québec

To guide this section, I draw from the SPEED research framework that analyzes regional socio-political factors with the potential to influence energy technology development (Stephens et al., 2008). I adapted the list of state-level socio-political factors to PEV policy implementation and applied it to the three case studies, as shown in Table 2. I use this framework to describe the socio-political contexts outlined below, which can help understand the PEV policy discourses in each case study. Next, I describe the socio-political factors found in Table 2 before summarizing key insights from the contexts of British Columbia, Ontario, and Québec.

Table 2 outlines the socio-political factors with potential influence on PEV policy development, the PEV sales by region (in 2011, 2015, and 2019), and the PEV policies implemented in each region between 2008 and 2018. The electricity sector factor relates to the technical and electrical resources needed to deploy PEV technology such as the existing infrastructure and how electricity is generated and distributed. The PEV experiences and research factor examines past and current research and experiences with PEV technology since 1980. The economic factor accounts for important economic activities such as the presence of the automobile industry or other industries with interest in PEVs. The social factor considers the public perception of PEV policies that can influence how policies are designed, framed, and implemented. Finally, the political factor examines important political events and the political saliency of climate and PEV policy from 2008 to 2018. Each of these factors is interdependent with the others and their interaction is dynamic throughout the different stages of policy formation and implementation (Stephens et al., 2008).

**Table 2.** **Regional socio-political factors with potential influence on PEV policy development (Inspired from the SPEED framework (Stephens et al., 2008))**

| Socio-political factors | British Columbia | Ontario | Québec |
|---|---|---|---|
| *Electricity sector* | - Mainly hydropower (91%)<br>- Involvement from provincial-owned electric utility | - Energy mix: nuclear (60%), hydropower (26%), wind (7%), solar (2%) and some natural gas and biomass (Government of Canada, 2020).<br>- Privately owned electric utilities | - Mainly hydropower (95%)<br>- Involvement from provincial-owned electric utility |
| *PEV experiences and research (1980 to present)* | - Powertech Labs (1979) | - Neighborhood electric vehicle (2006-2010) | - Research Institute of Hydro Québec (IREQ) (1970)<br>- Pilot projects |
| *Economic* | - Oil and gas production (CAPP, 2020) | - Automobile industry | - PEV industry |
| *Social* | - Mostly supportive of PEV policies (Long et al., 2020) | - Mostly supportive of PEV policies (Long et al., 2020)<br>- Public debates over climate and energy policies (Lachapelle et al., 2019; Mang-Benza et al., 2020) | - Mostly supportive of PEV policies (Long et al., 2020) |
| *Political* | - Climate salience in BC politics and early progressive climate policies | - Energy system reform and salience of climate in policy implementation<br>- Political adversity between political parties (Liberal and Progressive Conservative parties) (Lachapelle et al., 2019; Mang-Benza et al., 2020) | - Independence referendums in 1980 and 1995<br>- Strong stance towards climate policy implementation (Long et al., 2020) |
| ***PEVs new market share (% of new vehicle sales) in 2011, 2015, and 2019*** (Statistic Canada, 2020) | 0.05% (2011)<br>0.65% (2015)<br>7% (2019) | 0.04% (2011)<br>0.29% (2015)<br>1% (2019) | 0.03% (2011)<br>0.69% (2015)<br>5.5% (2019) |

| PEV-supportive policies (the date indicates when the policy has been implemented) | | | |
|---|---|---|---|
| *Demand-focused policies* | - Financial incentives (2011-present)<br>- Charging station investment (2011-present)<br>- Non-financial incentives (2011-present)<br>- Carbon tax (2008-present) | - Financial incentives (2010-2018)<br>- Charging station investment (2010-2018)<br>- Non-financial incentives (2010-present)<br>- Cap-and-trade (2017-2018) | - Financial incentives (2012-present)<br>- Charging station investment (2012-present)<br>- Non-financial incentives (2012-present)<br>- Cap-and-trade (2013-present) |
| *Supply-focused policies* | - LCFS (2008-present)<br>- ZEV mandate (2019-present) | - Cleaner Transportation Fuel regulation (2020-present) | - ZEV mandate (2018-present) |

The key factors of British Columbia's socio-political context are hydropower that accounts for 91% of electricity generation (Government of Canada, 2020b), engagement from key institutions such as British Columbia Hydro (BC Hydro) that generates most of BC's electricity, and government support for climate change mitigation. Specifically, BC Hydro helped the PEV development in the province by conducting PEV-related research through Powertech Labs, its own research center created in 1979 (BC Hydro, 2020). In terms of important economic sectors, BC is the second-largest oil and gas producer in Canada making the fossil fuel sector a central regional industry (CAPP, 2020). In 2008, BC introduced North America's first carbon tax followed in 2010 by the Low Carbon Fuel Standard (LCFS), which requires a reduction in the lifecycle carbon content of transportation fuels (Government of British Columbia, 2020). In 2011, the government introduced many demand-focused PEV policies such as financial incentives, investment in charging stations, outreach campaigns, and non-financial incentives (e.g., access to high-occupancy vehicle (HOV) lanes, free parking). While this policy has been implemented after my study period (in 2019), at the end of 2018 BC announced plans to implement a ZEV mandate, requiring 10% of new vehicles sold in 2025 be zero-emission, rising to 30% in 2030, and 100% in 2040 (Zero Emission Vehicles Act, 2019).

In Ontario, the key socio-political factors are the economic and political factors including an important automobile industry and the political debates around energy policy (Lachapelle et al., 2019; Mang-Benza et al., 2020). As the only Canadian province manufacturing automobiles, Ontario is responsible for 13% of North American vehicle

production (Government of Ontario, 2020a). This industry generates around 2.4% of Ontario's gross domestic product (GDP) and employs more than 100,000 people across the province, making this industry a key element of the province's economy (Government of Ontario, 2020a). Starting in 2008, Ontario reorganized its energy system to become a leader in clean energy, green jobs, and specifically, to phase-out coal (Stokes, 2013). This energy reform led to an increase in electricity prices that was criticized by the public and had a negative impact on the legitimacy of the provincial government at that time (Liberal government) (Jaccard, 2020; Lachapelle et al., 2019; Mang-Benza et al., 2020). Thus, between 2008 and 2018, climate and energy policies in the province were subject to controversy (more so than in other provinces). As shown in Table 2, the PEV policies implemented in Ontario were mostly demand-focused policies along with the introduction of a cap-and-trade, which sets a cap on greenhouse gas emissions and distributes permits to businesses allowing them to pollute within this cap. However, in 2018, the cap-and-trade (which funded financial incentives) was canceled by the new government (Progressive Conservative government). More recently (in 2020), the Ontario government introduced a regulation that requires fuel suppliers to lower the carbon intensity of their fuels. It also partnered with the Government of Canada to invest in the automobile sector to position Ontario as a leader in BEV manufacturing (Government of Canada, 2020a; Government of Ontario, 2020b).

In Québec, the key socio-political factors that may have facilitated PEV policy development are the province's source of hydroelectricity, the involvement from Hydro-Québec (the provincial-owned electric utility), and the establishment of a PEV-related industry and research base. In addition, Québec differs from the two other provinces culturally (mostly French-speaking, among others) and politically (the province conducted two referendums to become an independent country in 1980 and 1995, both unsuccessful). Similar to BC, Hydro-Québec played an important role in PEV development including the installation of a public charging network starting in 2012 (Haley, 2015; Lanoue et al., 2010; Posgate et al., 1976). Additionally, since 1970, Hydro-Québec's Research Institute (IREQ) has led research and development projects in battery technology that helped the PEV political legitimacy in Québec (Haley, 2015). Aside from PEVs, Hydro-Québec has also helped the development of many industries in Québec such as aluminum and pulp and paper (Carpentier, 2006; Dales, 1957; Niosi, J., Faucher, 1987). For instance, Hydro-Québec was used by the government as an

instrument of economic development by providing a supportive and economic context to the engineering industry (Niosi, J., Faucher, 1987). Hence, Québec is home to an innovative PEV-related industry, which regroups many industries concentrated in specialized electric vehicles and heavy-duty vehicles (Haley, 2015). In 2012, Québec implemented many demand-focused policies including financial incentives, investment in charging stations, and substantial investment in its PEV industry. In 2013, Québec became part of the Western Initiative that administers the North American cap-and-trade system. In 2018, Québec became the first province during this study's timeline (2008-2018) to use a supply-focused policy for PEVs, a ZEV mandate. More recently, the government announced new targets including a ban on gasoline vehicle sales starting in 2035 (AVÉQ, 2020; Chouinard, 2020).

## 1.5. Research objectives and expectations

This study aims to shed light on PEV policy implementation by focusing on policy discourses in the case studies of British Columbia, Ontario, and Québec. Specifically, I try to answer the following research questions: what storyline do the different governments and other key actors (discourse coalitions) promote in the decade of 2008-2018? Do these storylines shed insight as to why each province implemented different PEV-supportive policies at different times? The specific research objectives of this study are to:

1. Conduct a (quantitative) content analysis of statements retrieved in newspaper coverage from 2008-2018 to compare how provincial governments and other actors framed PEVs and PEV policy.

2. Conduct a (qualitative) discourse analysis of these media statements to identify discourse coalitions in each province and compare the storylines they put forth.

3. Compare similarities and differences in the PEV policy discourses captured in each province.

I have several expectations for the outcomes of my three research objectives, which are briefly described next:

First, I expect governments to frequently mention positive environmental and economic frames of PEVs and PEV policy. However, I expect to find more mentions of the economic frames in Ontario and Québec given the importance of the automobile industry (in Ontario) and the PEV-related industry (in Québec). Additionally, I expect provincial governments to mostly mention positive frames of the PEV policies implemented in their region during the study period (2008-2018). For instance, I expect that the Québec government will frequently mention positive frames of financial incentives, charging stations, and a ZEV mandate.

Second, I expect that all governments promote a PEV policy storyline focused on climate or environmental imperatives, but with regional distinctions. Specifically, I expect the government in British Columbia to promote a storyline that is embedded within the province's climate targets similar to the "clean energy storyline" (Dusyk, 2016), the government in Ontario to promote a storyline around economic benefits for the automobile industry similar to the discourse focused on "green economic development" found by Mang-Benz et al. (2020), and the government in Québec to promote a PEV policy storyline based on both climate and economic motives, given the importance of the PEV technology industry in Québec (Haley, 2015).

Third, I expect to find regional distinctions in the storylines found from other actors given their different involvement in each region, as noted in Section 1.4. I expect that the automobile industry in the three provinces, and especially in Ontario, will promote storylines that oppose supply-focused policies. I also expect actors from opposing political parties to play an important role in Ontario (more than in BC and Québec) given the political debates that characterize climate policy in the decade of 2008-2018 (Jaccard, 2020; Lachapelle et al., 2019; Mang-Benza et al., 2020).

The remainder of this study will be structured as follows. In Chapter 2, I outline the mixed-method approach applied to media statements in this study. In Chapter 3, I present results from the content analysis whereas, in Chapter 4, I present the results from the discourse analysis as well as specific findings from each case study. In Chapter 5, I discuss my findings in the context of my three research objectives, the literature reviewed above, before discussing the limitations of this study and offering recommendations for future research directions. Finally, in Chapter 6, I provide some concluding remarks.

# Chapter 2.

# Method

This study uses a mixed-method approach to media analysis of newspaper articles to assess how PEVs and PEV policies were framed in statements from the provincial government and other actors during the study period (2008-2018). A mixed-method approach integrates quantitative and qualitative research methods in a single study, as illustrated in Figure 1 (Creswell, 1999; Denzin & Lincoln, 2011; Sovacool et al., 2018). First, content analysis focuses on providing a quantifiable and objective analysis of the data. Second, discourse analysis emphasizes interpretation and provides an interpretative analysis of that same data (Sovacool, Axsen, et al., 2018). However, given that I was the only coder (thus did not perform inter-coder reliability), the content analysis remained subject to my interpretation, a limitation that will be discussed in Chapter 5. To integrate both methods, I adopted a sequential approach in which I first conducted the content analysis that informed and guided my approach to discourse analysis. By using insights from both methods, I aim to compare results across case studies and provide an in-depth examination of the meaning of the statements.

In this chapter, I detail the unit of analysis and the methods of data collection before outlining the two research methods and how I integrated them to answer my research objectives. The coding guide created and used for the content analysis was applied to explore the first research objective highlighted in Chapter 1. The complete version of the coding guide can be found in the Appendix.
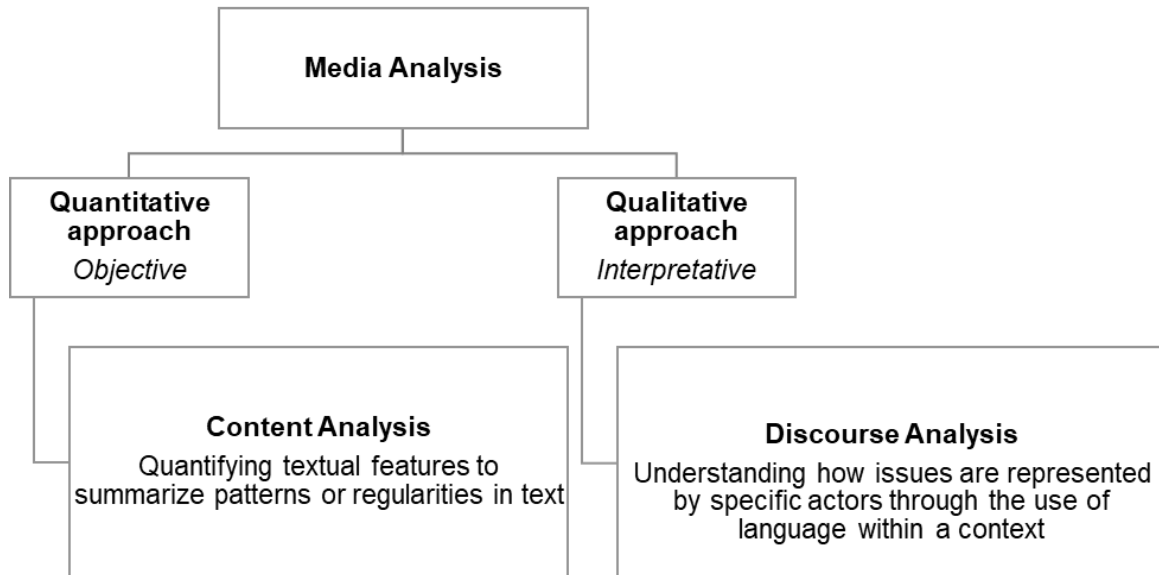
**Figure 1.**      **A mixed-method approach to media analysis**

## 2.1.  Data collection and unit of analysis

I examined printed and online newspaper articles published between 2008 and 2018 as most of the PEV and climate policies in Canada were introduced within that period and because general media attention (in the US) for PEVs started to increase around 2008 (Melton et al., 2016). Moreover, PEVs were commercially available in Canada starting in 2011 and most of the articles about PEV technology were published afterward. I chose the two highest circulated newspapers (in 2014) per province with the following final selection: The Province and the Vancouver Sun in British Columbia, the Toronto Sun and the Toronto Star in Ontario, and La Presse and Le Devoir in Québec (see Table 3).

I use newspaper articles as a tool to access statements from governments and other actors given that newspapers act as a forum, or site of argumentation, in which many actors compete to promote their perceptions on an issue (Carragee et al., 2004; Gamson, William a., Modigliani, 2009; Gamson, William a. et al., 1992; Runhaar et al., 2006). In this study, I am interested in the analysis of the social (or public) discourses around policy. This public and social perspective is key to identify the social interactions between actors, coalitions, and a policy context. Consequently, analyzing discourse through the lens of the media reflects the interplay of competing frames and storylines put forth by actors and helps identify potential discourse coalitions.

The analysis of statements retrieved from newspapers provides insights into the different storylines and discourse coalitions that emerge beyond the political system and from different actors over time. Generally, the analysis of discourse (and especially government discourse) involves the investigation of different sites of discourses such as government documents, news releases, reports, or speeches. As mentioned earlier, the analysis of such documents was not within the scope of this study, a limitation that will be discussed in Chapter 5.

Through the Canadian Newsstream (English articles) and Eureka (French articles) databases, I used the keywords "electric vehicle" OR "electric car" OR "zero emission vehicle" AND "rebate" OR "standard" OR "regulation" OR "policy" OR "government" OR "mandate" OR "subsidy" to search and collect articles. For French articles, I used the following French keywords that are adapted to Québec vocabulary: "auto électrique" OR "voiture électrique" OR 'véhicule zero émission" AND "rabais" OR "mandat" OR "loi" OR "régulation" OR "politique" OR gouvernement". All types of articles were included in the search such as general news, opinions, and editorials. Each article retrieved was screened and reviewed before selection. An article was selected if it reported on PEVs or PEV policy. Additionally, I eliminated articles that had less than 300 words and articles about fuel cell vehicles or conventional hybrid electric vehicles. As shown in Table 3, a total of 984 newspaper articles were selected: in British Columbia, 367 articles were retrieved, compared to 383 in Ontario and 234 in Québec.

**Table 3.** Description of newspapers selection and articles retrieved in each region

| Newspapers | Weekly circulation (in 2014) (News Media Canada, 2020) | Articles retrieved |
| --- | --- | --- |
| The Province | 760,874 | 168 |
| The Vancouver Sun | 869,571 | 199 |
| Toronto Sun | 967,574 | 288 |
| Toronto Star | 2,397,691 | 95 |
| La Presse | 1,734,445 | 162 |
| Le Devoir | 214,263 | 72 |

Given that I focus on policy discourse, the unit of analysis of this study is statements from the government and other key actors, rather than the newspaper article itself. A statement was identified when the actor was directly cited or paraphrased. Indirect and hypothetical references such as "the government would say" were not identified as statements. In a statement, actors could mention multiple PEV frames and PEV policies. However, each frame was coded a maximum of once per statement. For instance, a statement could include two different categories of PEV frames (e.g., private-financial AND private-performance) and two mentions of PEV policies (e.g., mention of financial incentives AND mention of ZEV mandate) that were all coded once. Each statement was analyzed quantitively and qualitatively. However, I did not analyze statements from opinion articles in the content analysis because these types of articles reflect the view of one actor thus the frequencies of statements (and frames) would not be comparable with the variety of statements retrieved from regular news articles. Instead, opinion articles were analyzed qualitatively during the discourse analysis to investigate the storyline of a specific actor. While statements are the focus of the analysis, the content of the articles was thoroughly read to position statements within their broader context.

The categories of actors have been chosen based on their general involvement related to PEVs and PEV policy and their presence within media coverage. Initially, I coded multiple actor categories that I later grouped (for reasons such as small sample size, or similarity in patterns across similar categories). For instance, I analyzed and

coded statements from electric utilities given their strong involvement with PEVs in British Columbia and Québec but in all three provinces, electric utilities were not a dominant actor within newspaper coverage (i.e., low number of statements). Therefore, these statements were not included in my analysis. The final categories of actors analyzed are as follows: provincial government, automobile industry, advocacy groups, experts, and other political actors outside of government. The categories of actors are defined in Chapter 3.

In the remainder of this chapter, I detail the mixed-methods approach used in this study before explaining how I integrated insights from both methods to answer my research objectives presented in Chapter 1.

## 2.2. Content analysis

The quantitative component of the analysis relies on content analysis which translates textual features, patterns, and regularities into quantitative values. Essentially, content analysis involves counting the content of textual forms of communication such as words or concepts that are predefined (Tonkiss, 2004). The strength of this approach lies in the clear and systematic analysis of textual content along with its utility for large scale and comparative data (Tonkiss, 2004). However, this method is limited to *what* is said rather than *how* it is said. In other words, the content analysis provides a descriptive analysis of the data rather than an analysis of the meaning of that data. Thus, content analysis in this study is useful to explore my first research objective and specifically how PEVs and PEV policies were framed in statements from the government and other actors.

I used *NVivo 12* to code and analyze: (1) the frequencies of PEV frames mentioned in each statement that was guided by the PEV private-societal framework presented in Section 1.2., and (2) the frequencies of policy frames (positive, negative, or neutral/mixed) mentioned in each statement. I summarized the coding guide in Table 4, but the full version can be found in the Appendix. A statement mentioning a policy is considered "neutral/mixed" when it objectively mentioned the policy without supporting or opposing it or stated a mix of positive and negative frames (labeled "neutral" in the graphs and in the results sections). I was the only researcher who analyzed and coded the statements, so intercoder reliability was not assessed. Thus, while content analysis

relies on an objective analysis of the data, I acknowledge that the content analysis performed in this study remains subject to my interpretation (in both the creation of the PEV private-societal framework and the coding process).

The results from the content analysis are displayed in Chapter 3 as proportions of the total of frames mentioned (i.e., mentions) by actor and as proportions of the total of policies mentioned by an actor. However, when an actor category stated less than 15 mentions, I presented results in the number of mentions rather than the proportion (with some exceptions). I did not perform statistical analyses on the results because I analyzed the full population of articles, rather than a sample (thus, there is no sampling error).

**Table 4.　　　Summary of the coding guide**

| Sections | Description | Code categories |
|---|---|---|
| **Article information** | This section codes general information about the article (some examples in the next column). | Main subject of the article:<br>• PEV policy<br>• Climate policy<br>• Automobile industry<br><br>Focus of the article:<br>• PEV technology<br>• PEV policy<br>• Both<br><br>Section of the newspaper:<br>• General news<br>• Automobile section<br>• Business<br>• Opinion<br>• Others |
| **PEV frames** | This section codes statements from actors mentioning PEVs according to the categories found in the PEV private-societal framework. | Private frames (can be positive or negative):<br>• Financial<br>• Performance<br>• Convenience<br>• Identity<br>• Others<br>Societal frames (can be positive or negative):<br>• Environmental<br>• Economic<br>• Innovation<br>• Others |
| **Policy frames** | This section codes statements from actors mentioning a PEV policy according to these frames: positive, negative, or neutral/mixed. | Demand-focused policies:<br>• Financial incentives<br>• Charging infrastructure<br>• Outreach campaigns<br>• Carbon pricing<br>• Non-financial incentives<br>• Others<br><br>Supply-focused policies:<br>• ZEV mandate (or standard)<br>• Vehicle emission standard<br>• Clean fuel standard |

## 2.3. Discourse analysis

The qualitative component of the analysis is based on an analytical approach that seeks to interpret the way a phenomenon is linguistically represented in a particular context (Hajer, 2002; Saldaña, 2015). In contrast to the first research method, the analysis of meaning is central to discourse analysis (Hajer et al., 2005). Therefore, discourse analysis is based on subjectivity and interpretation to derive meaning from the data analyzed. As mentioned in earlier sections, the discourse analysis conducted in this study differs from conventional discourse analysis that focuses on document analysis. Because I aim to shed light on the policy discourses around PEVs in different regions during the decade 2008-2018, I chose to investigate discourse through mediated statements from government and actors. Therefore, my definition of discourse analysis focuses on a selected form of discourse (statements, rather than entire documents) to access the storylines put forth by various actors and identify potential discourse coalitions.

While many approaches can be undertaken to perform a discourse analysis, I adopted an approach that focuses on three components. First, I concentrated on how a particular framing used in a statement creates meaning, values, and narratives. Second, I accounted for the socio-political context in which those statements were cited, and third, I examined how governments and actors actively try to influence a problem definition through storylines and potential coalition formation (Hajer et al., 2005). In other words, I analyzed statements to identify storylines that actors use to frame and communicate about PEVs and PEV policies. Therefore, rather than quantify features from the text, I aimed to achieve a richer analysis that includes the context and accounts for the influences of sources, events, and use of vocabulary (e.g. metaphors, references, arguments, tones, comparison, etc.) (Pan et al., 1993; Richardson, 2007).

The analysis of discourse often deals with smaller populations or samples of articles or text (Tonkiss, 2004). However, in this study, all statements retrieved from the 984 articles were substantively analyzed. I pulled representative statements to demonstrate the storylines discovered throughout the discourse analysis, which are detailed in Chapter 4. Therefore, the results from this method differ from the content media analysis as the storylines and broader policy discourses are descriptive rather than quantitative.

## 2.4. Integration of methods

The integration of quantitative and qualitative methods can be performed in many ways. I chose a sequential approach with two phases (Creswell, 1999; Denzin, N. K., & Lincoln, 2011), where I first I implemented the quantitative study, and then conducted the qualitative study.. For instance, with the frequencies of mentions retrieved from the content analysis, I was able to guide and inform my interpretation of storylines throughout the discourse analysis. Hence, I integrated the two methods by having the discourse analysis and its results (i.e., storylines) built from the content analysis and its results (i.e., frequencies of mentions). To compare PEV policy discourse between regions, I gave priority, or more weight, to the qualitative discourse analysis given that it is best for accessing more in-depth information relative to how government and other actors create meaning around PEVs and PEV policy. Therefore, I adopted a mixed-method approach to gain from the strengths of each method and achieve depth in the meaning of those results.

These two research methods provide distinctive outcomes, though both are valuable for my stated research objectives. Both differ according to the nature of data collection as well as the means of analyzing that data. First, the quantitative component of the media analysis informs my first research objective by analyzing frequencies of mentions to identify the dominant frames mentioned by the provincial government and other actors. By identifying patterns and frequencies, I can better structure my approach to discourse analysis. For instance, a higher count for a specific policy might suggest that an actor focuses its discourse on that policy. Second, the qualitative component (guided by insights from the content analysis) informs my second research objective. Consequently, discourse analysis will inductively analyze and derive meaning from data to access an in-depth perspective that recognizes the importance of relationships, differences, and similarities among the different components analyzed (Peters et al., 2018). Insights from both methods will inform my third research objective that aims to compare similarities and differences in the PEV policy discourse of each region. Nonetheless, this mixed-method approach and both methods have limitations that will be discussed in Chapter 5.

# Chapter 3.

# Content media analysis results

In this first result chapter, I outline the key results relating to my first research objective. Specifically, I show the frequencies of mentions regarding the frames of PEV technology and PEV policy in the statements from the governments and other actors in British Columbia, Ontario, and Québec newspaper coverage. For each case study, I first present mentions of PEV frames by actor category (government followed by other actors) before presenting mentions of policies. The results are displayed as proportions of the total mentions by an actor. However, for categories where I found a small number of mentions (less than 15 mentions of PEV frames or policy frames by a given actor), I show results in the number of mentions, rather than proportions of total mentions[1]. Before presenting the results for each case study, I first show the number of newspaper articles with mentions of PEVs and PEV policy that were selected in each province from 2008 to 2018 (Figure 2) followed by the distribution of articles published in the main sections of newspapers (Figure 3) to present an overview of the context in which PEVs and PEV policy are mentioned in newspaper coverage. In addition, I define each actor category and show the distribution of statements for each by province (Figure 4).

Figure 2 shows the number of newspaper articles about PEVs and PEV policy per province and the timeline of the important PEV policies implemented in each region in the decade 2008-2018. Québec shows an overall low number (N=234) of newspaper articles (especially after 2014) compared to BC (N=367) and Ontario (N=383), where the number of articles increased overtime. However, in the three regions, the number of articles decreases in 2014 but then increases until 2016. This increase in coverage about PEVs and PEV policy might be explained by many factors such as the global interest in PEV technology during those years. In this study, I did not investigate the causality between external events and newspaper coverage, but I acknowledge that coverage of PEVs and PEV policy can be influenced by external factors.

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[1] With some exceptions: mentions from experts (N=10) in Figure 5, experts (N=12) in Figure 7, advocacy groups (N=14) in Figure 11, and experts (N=10) in Figure 13.
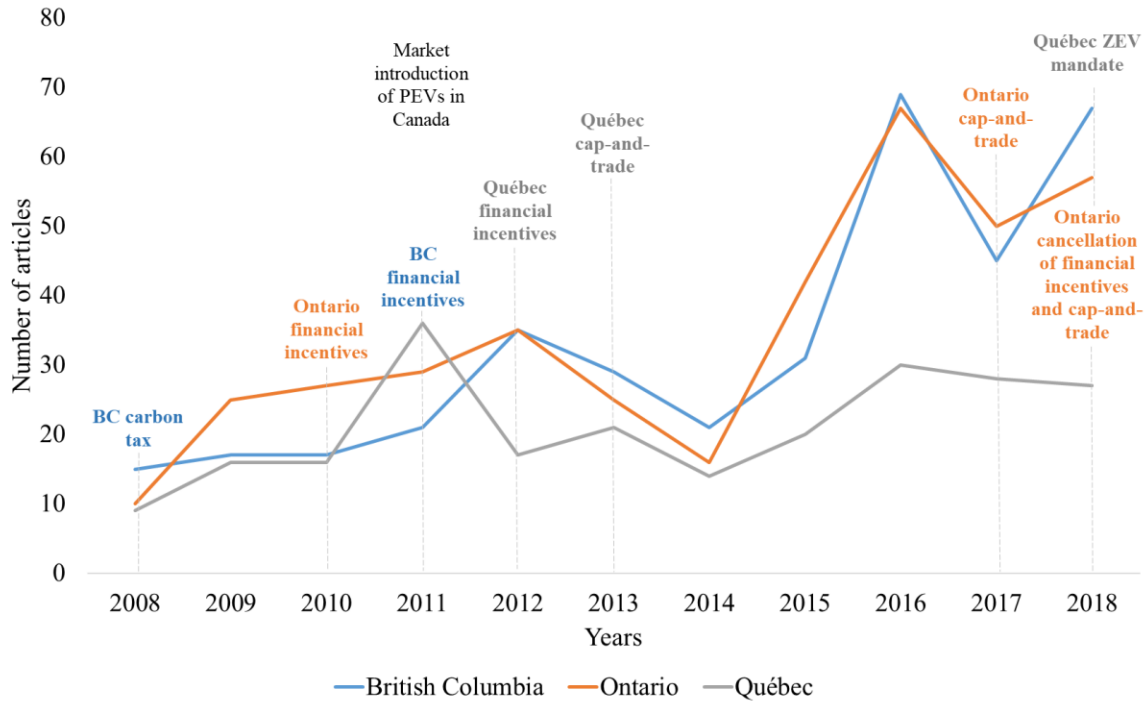
**Figure 2.**    **The number of newspaper articles selected in BC (N=367 articles), Ontario (N=383), and Québec (N=234) and PEV policies implemented in each province between 2008 and 2018.**

The distribution of articles per section of newspaper is illustrated in Figure 3. This figure shows the main sections where articles about PEVs or PEV policies were published: "General news", "Cars" and "Opinion" sections. In all three provinces, 48% of the articles were published in the "Car" section of newspapers and especially in British Columbia where 59% of the articles were published in that section (see Figure 3).

Some articles were written by a stakeholder representative but were not necessarily published in the "Opinion" section of newspapers. In BC, 45% of the total articles in The Province and the Vancouver Sun were written by stakeholder representatives compared with 16% in Ontario and 10% in Québec. In BC, most of these articles (122 articles or 33% of the total 367 articles retrieved) were written by one actor, the New Cars Dealers Association of BC, and these articles were published mainly in the "Car" section. In contrast, in Ontario, only 10 articles were written by a representative of the automobile industry and none in Québec. During the content analysis, I excluded articles that were: i) written by a representative, or ii) published in the Opinion section of

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newspapers. My reasoning is that such articles represent the view of one specific actor, where statements retrieved for the content analysis might bias the overall count for this actor category. However, these articles were analyzed during the discourse analysis to explore further the storyline of specific actors.
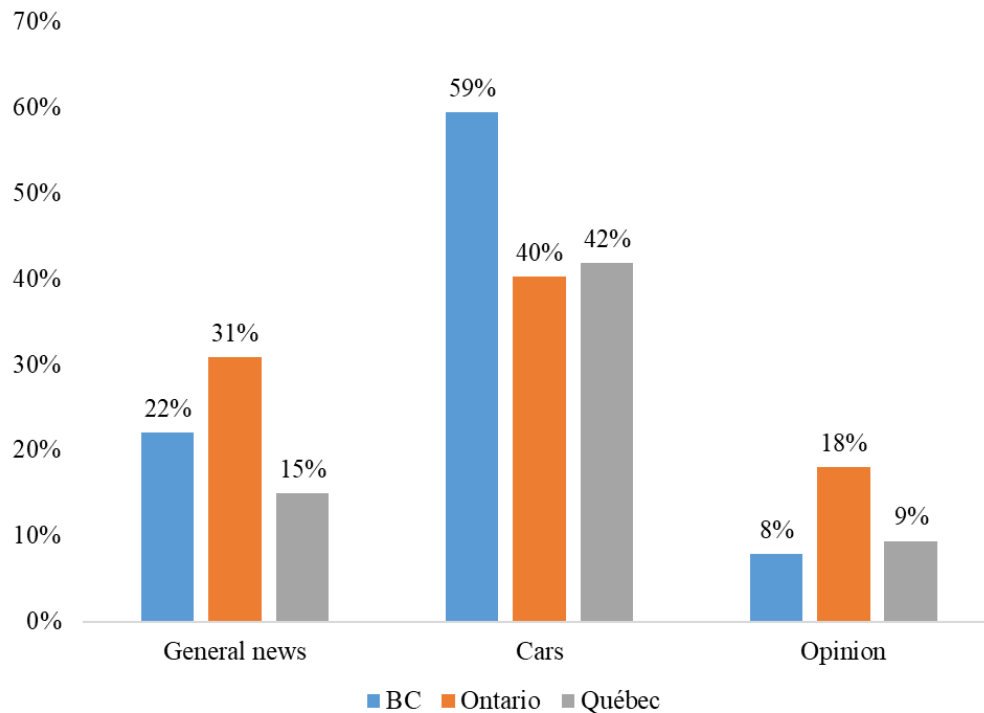


**Figure 3.** **Proportions of articles published in different sections of newspapers: General news, Cars, and Opinion sections.**

Next, I define each actor category (with examples) and summarize the distribution of mentions by actor category in Figure 4. Here are the final actor categories:

- **Provincial government**: actors from all levels of the provincial government such as premiers, ministers, government spokespeople, and governmental agencies.
- **Automobile industry**: actors from the private sector with interests in the automobile industry such as manufacturers, dealerships, associations, and industry analysts.
- **Advocacy groups**: regional non-governmental organizations (NGOs) promoting PEV adoption such as the Vancouver Electric Vehicle Association (VEVA) in BC and NGOs that aim to inform the public and policymakers about climate, energy,

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and transportation issues such as the Pembina Institute, Clean Energy Canada, Greenpeace, and the David Suzuki Foundation.

- **Experts**: actors with recognized expertise such as researchers, academics, or other actors having specialized knowledge relevant to PEVs and/or policy.
- **Opposing political parties**: political actors from an opposing political party.

As shown in Figure 4, I found some variations in the distribution of mentions by actor category in each province. First, compared to BC (N=21 total mentions) and Québec (N=29), the government of Ontario has two to three times more mentions of PEVs and PEV policy (N=65). Also, opposing political parties in Ontario have more mentions (N=35) than in BC (N=2) and Québec (N=21). Second, the automobile industry is a dominant actor category in the newspaper coverage of the three case studies and especially in BC (N=94). Third, other actors in Québec have more mentions than in BC and Ontario: advocacy groups in Québec have the most mentions (N=86) in this province and experts have 58 mentions compared with BC (N=18) and Ontario (N= 25). In short, the automobile industry in BC newspaper coverage has significantly more mentions in that province (and more than Ontario and Québec) while political actors in Ontario have more mentions than the two other provinces. In contrast, Québec has overall more mentions from different actors such as advocacy groups and experts than in BC and Ontario.
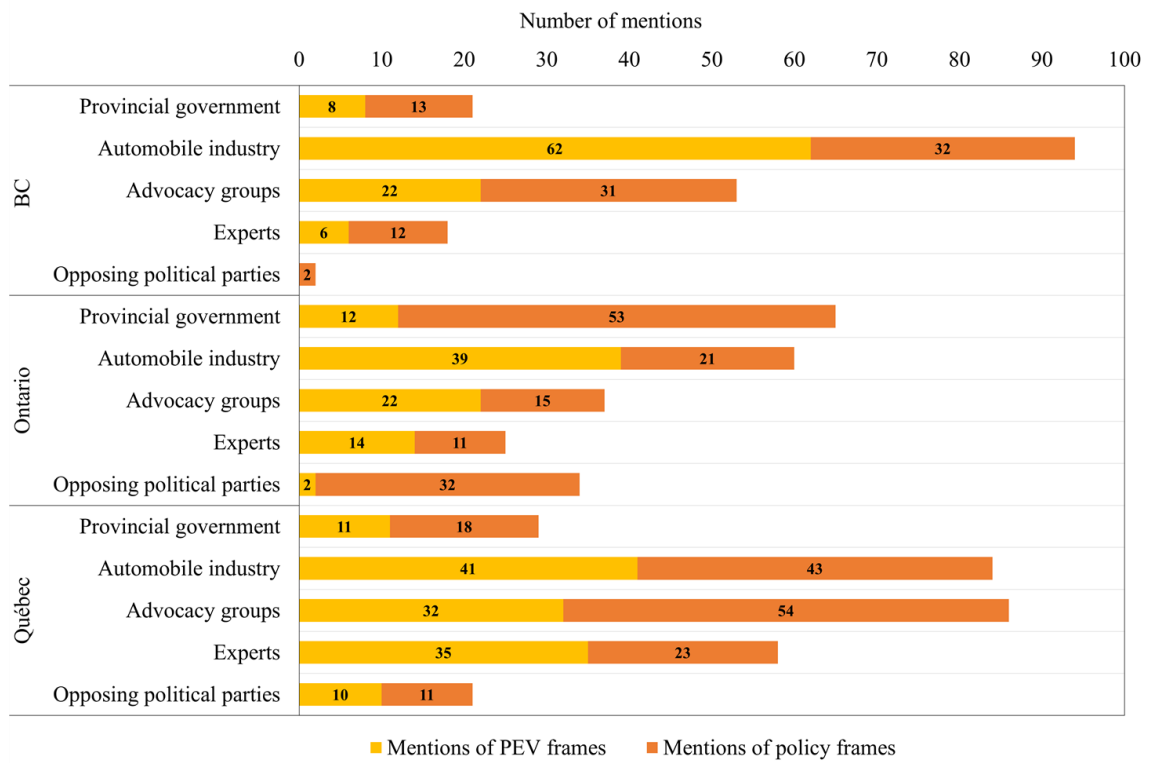
**Figure 4.** **Distribution of PEV and policy mentions by actor category in each province**

## 3.1. British Columbia media content analysis

While the number of mentions is low (N=8) compared to other actors, the results in Figure 5 suggest that the government in BC mostly mentioned the environmental benefits of PEV technology (3 mentions). Additionally, the government also mentioned some barriers for consumers in the performance and financial frame categories.
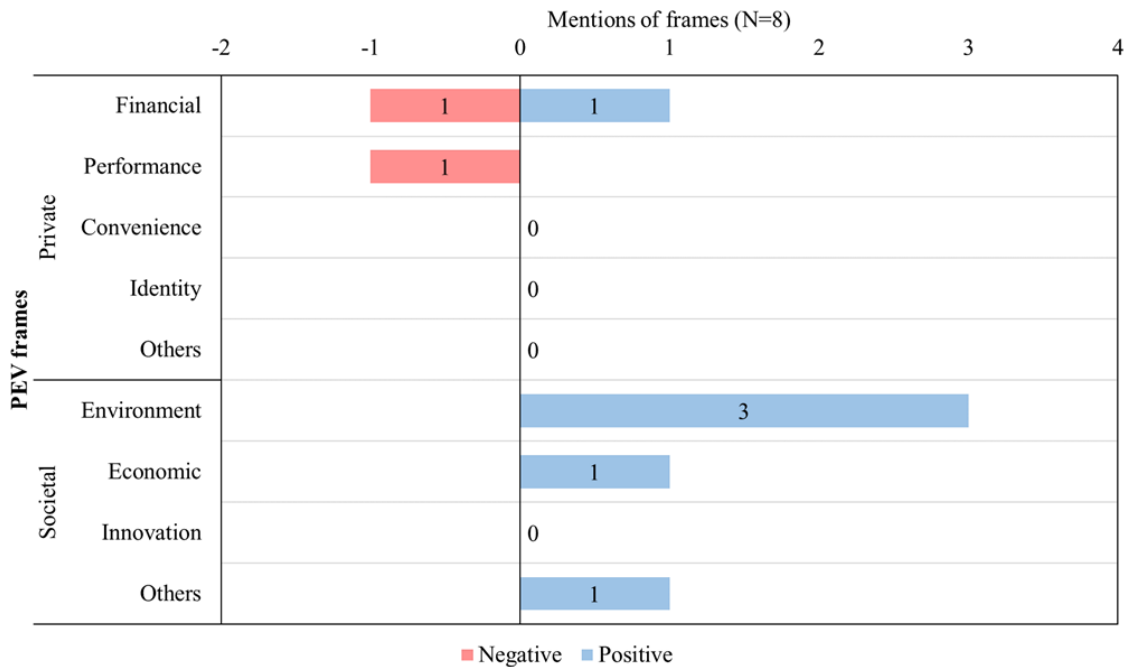


**Figure 5.** **Mentions of PEV frames by the provincial government in British Columbia newspaper coverage between 2008-2018 (note that the x-axis in the graphs shows negative numbers, but these values should be interpreted as absolute values).**

Compared with the PEV framing of the government, the other actors in BC mostly focused on a private and negative framing rather than a societal and positive framing, as shown in Figure 6. Specifically, the automobile industry and advocacy groups mostly mentioned private negative frames while experts mentioned more positive frames than negative frames. In BC, the main advocacy group that mentioned PEV frames is VEVA. The automobile industry frequently mentioned private negative frames (53% of mentions) including the financial frame with 30% of all mentions and most (24%) are negative. Similarly, advocacy groups frequently mentioned private negative frames (55%) such as the financial frame and the performance frames. In contrast, while having

a low number of mentions (N=6), experts mentioned more positive frames (4 mentions) such as the financial frame (2 mentions, both positive) than negative frames.
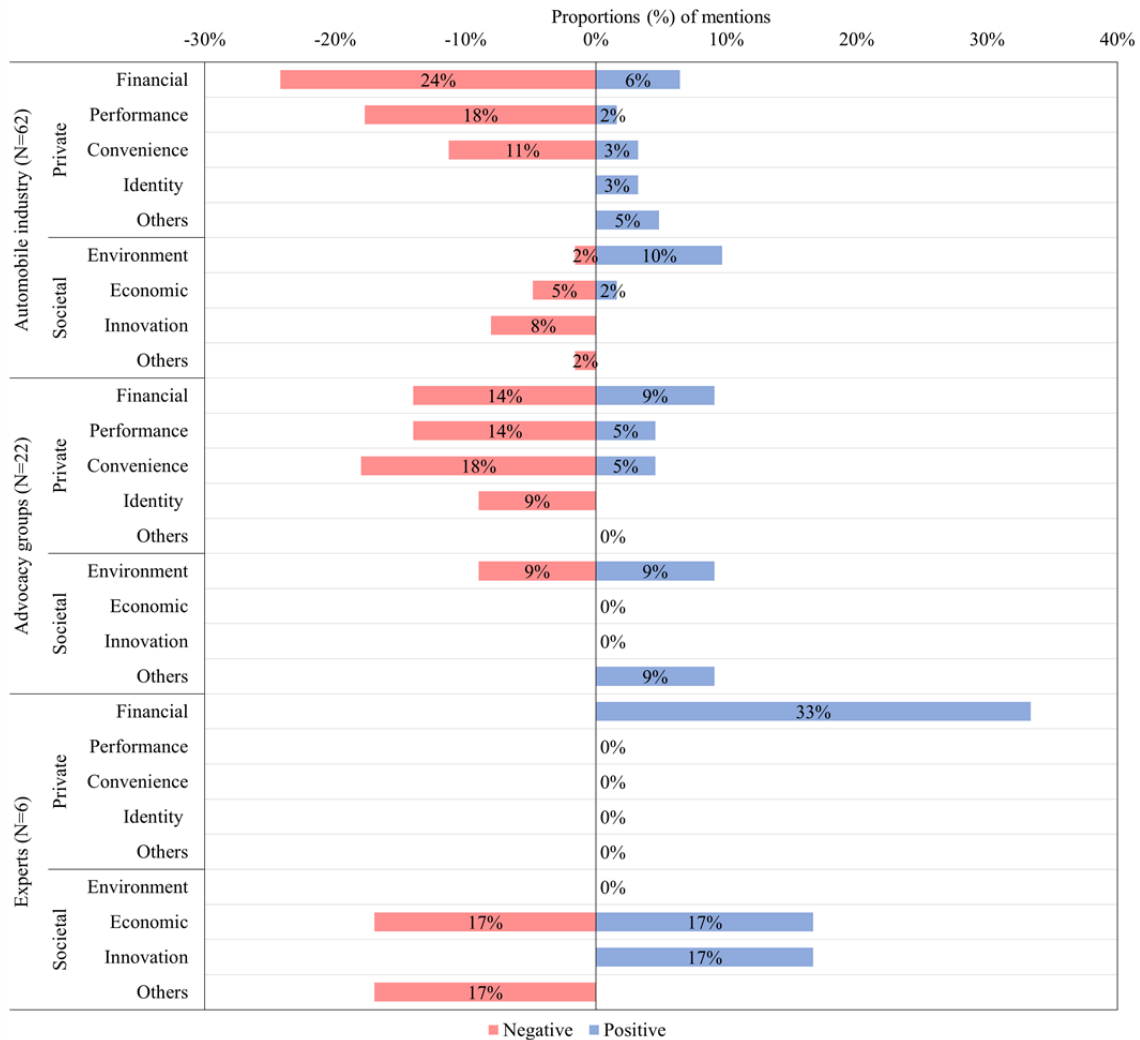


**Figure 6.** **Proportions of PEV frames mentions by the automobile industry, advocacy groups, and experts in BC newspaper coverage between 2008-2018.**

I found 13 mentions of PEV policy from the provincial government that focused on demand-focused policies, as shown in Figure 7. Of those mentions, most of them are positive and focus on financial incentives and charging station development. Unexpectedly, I found no mentions from the provincial government regarding supply-focused policies such as the ZEV mandate (announced in late 2018) or the Low Carbon Fuel Standard (implemented in 2008).
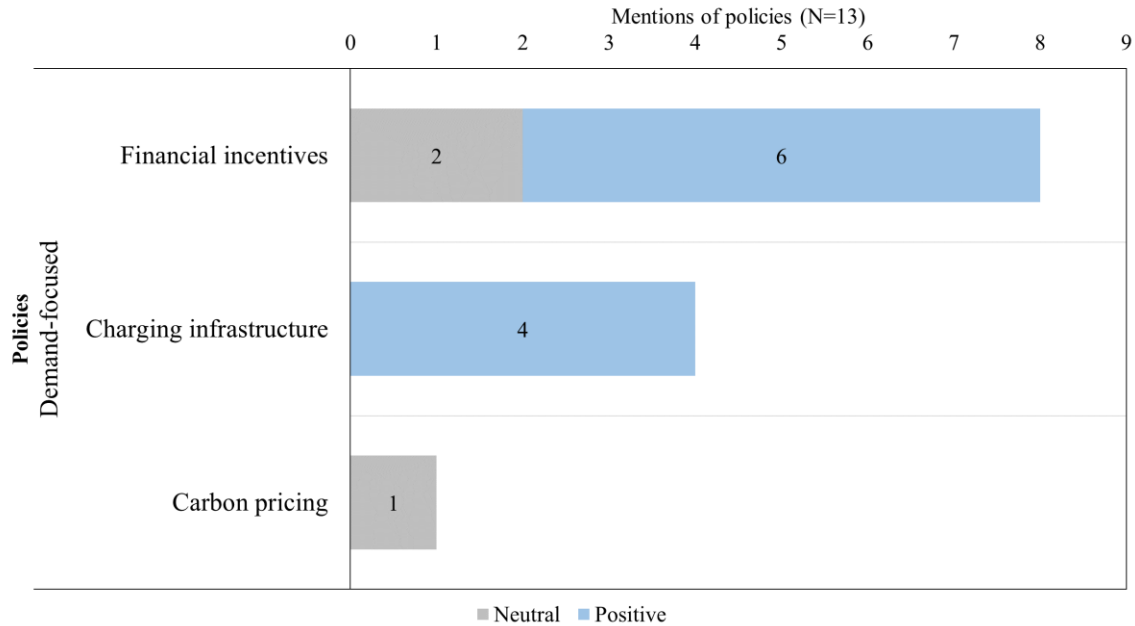
**Figure 7.** **Mentions of PEV policies from the provincial government in British Columbia newspaper coverage between 2008-2018.**

The results in Figures 7 and 8 suggest that the automobile industry and advocacy groups in BC (e.g., VEVA, Pembina Institute, Clean Energy Canada, the David Suzuki Foundation, and the Fraser Basin Council) share a similar framing of PEV policy as the provincial government, which focused on positive mentions of demand-focused policies. Specifically, the automobile industry mentioned financial incentives with 60% of mentions and 44% of those mentions are positive. Likewise, advocacy groups also focused on financial incentives with 61% of mentions and most (52% of total) are positive. Advocacy groups also mentioned a ZEV mandate with 13% of mentions and most (10% of total) are positive. Differently, experts stated financial incentives with 25% of mentions, all negative. Experts also mentioned supply-focused policies such as the ZEV mandate with 17% of mentions, all positive.

Figure 8.        Proportions of policy mentions from the automobile industry, advocacy groups, and experts in British Columbia newspaper coverage between 2008-2018

## 3.2.  Ontario media content analysis

Similar to BC, the provincial government in Ontario has fewer mentions of PEV frames (N=12) compared to the other actors. As shown in Figure 9, the government in Ontario frequently mentioned societal frames (10 mentions, all positive) and especially the environment frame with 4 mentions while economic, innovation, and other societal frames have each 2 mentions.

Mentions of frames (N=12)

| | | Positive |
|---|---|---|
| Private | Financial | 1 |
| | Performance | 0 |
| | Convenience | 0 |
| | Identity | 0 |
| | Others | 1 |
| Societal | Environment | 4 |
| | Economic | 2 |
| | Innovation | 2 |
| | Others | 2 |

■ Positive
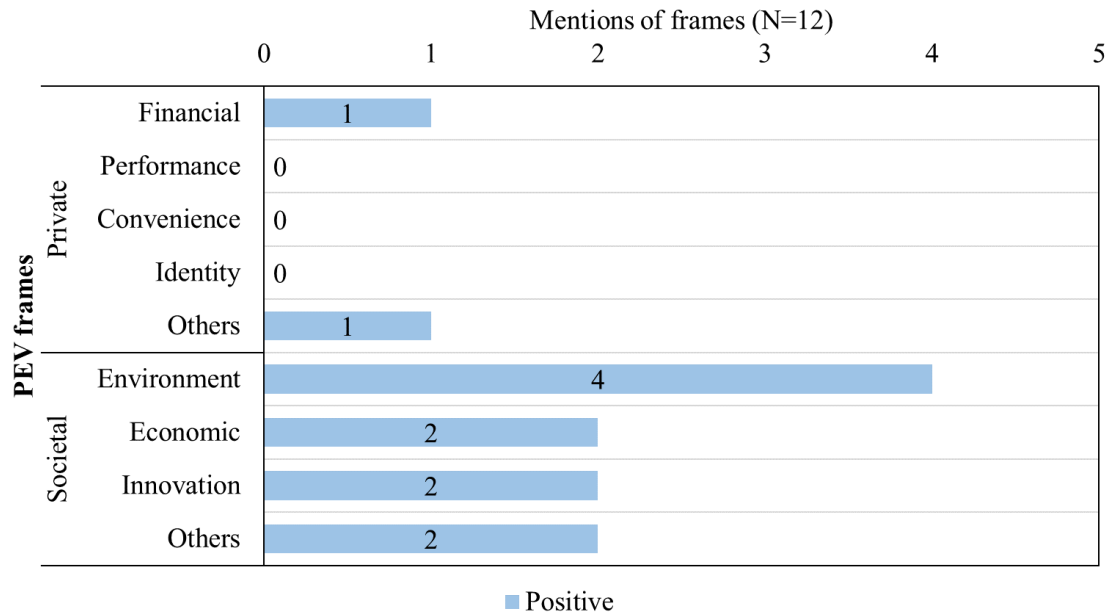
**Figure 9.     Mentions of PEV frames by the provincial government in Ontario newspaper coverage between 2008-2018.**

As shown in Figure 10, the automobile industry and experts mentioned PEVs mostly around private negative frames while advocacy groups mentioned a mix of positive and negative frames. In Ontario, the main advocacy groups are Greenpeace, Environmental Defence, the Electric Vehicle Society of Canada, and Plug-in Drive, an NGO that aims to raise awareness and foster PEV adoption. While opposing political parties have a significant number of mentions in Ontario (N=35 mentions), they have only 2 mentions of PEV frames thus this actor category is not shown in Figure 10. Similar to BC, the automobile industry mostly mentioned negative (65% of mentions) and private frames (60% of mentions) such as the financial frame. Similarly, experts also mostly mentioned private (78%) and negative (64%) frames. Like experts in BC (N=6), experts in Ontario have a lower number of mentions (N=14) compared to the other actors. Advocacy groups mentioned fewer private frames (56%) than the other actors but frequently mentioned the convenience frame with 23% of mentions, all negative. Different than the other actors, advocacy groups mentioned more positive frames such as the environmental frame. These results suggest that similar to BC, PEVs in Ontario are mainly framed by the automobile industry around private and negative frames.

40

Moreover, the other actors in Ontario also mostly focused on a private and negative framing rather than a societal and positive framing, which is put forth by governments.
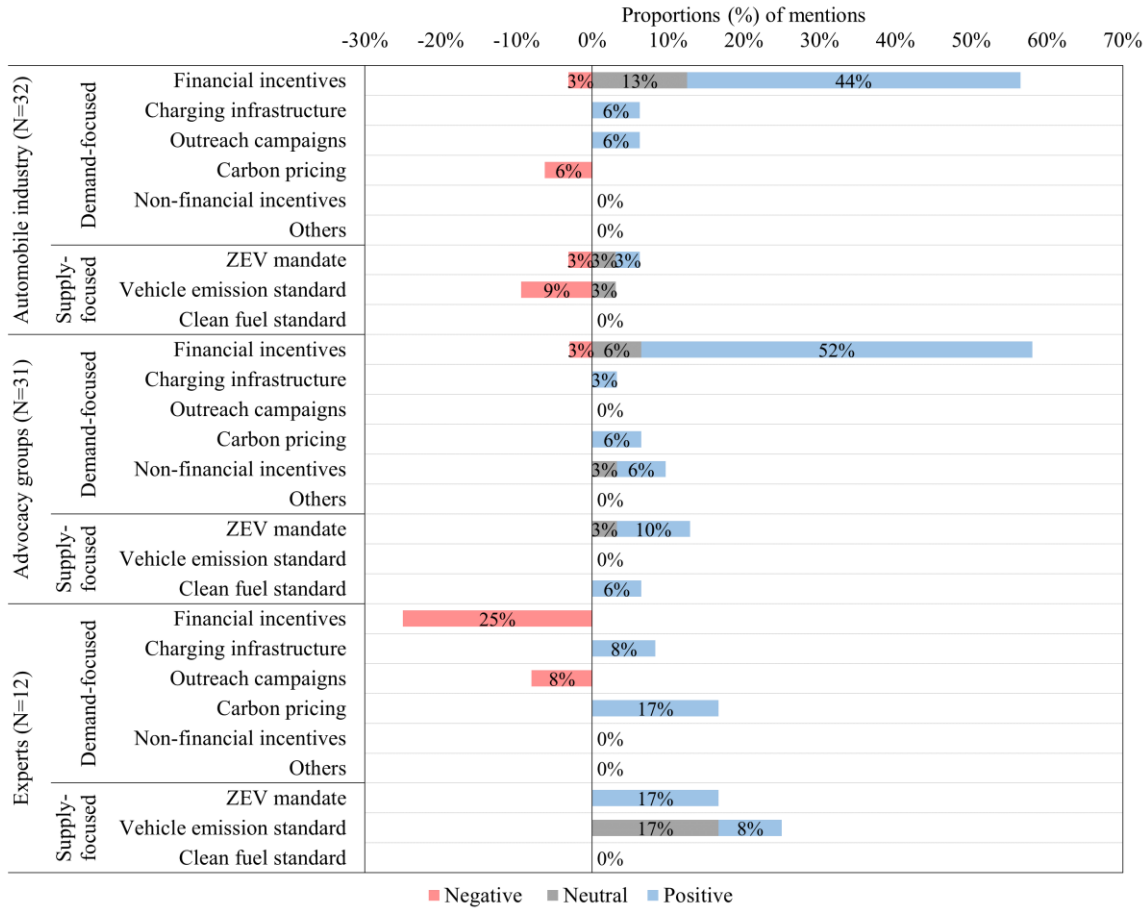
Proportions (%) of mentions
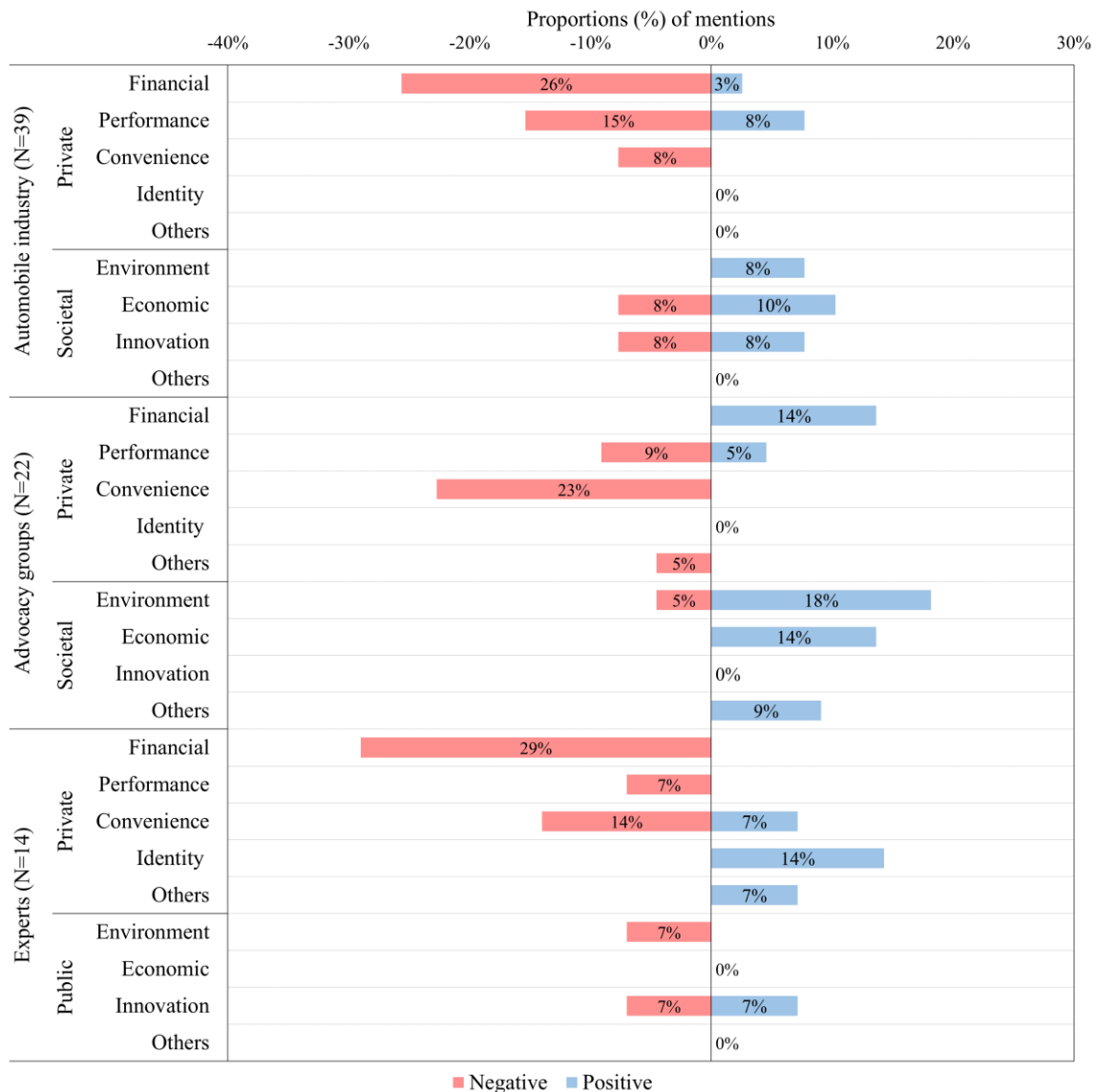


**Figure 10.** **Proportions of PEV frames mentions by the automobile industry, advocacy groups, and experts in Ontario newspaper coverage between 2008-2018.**

As expected, I found that the government in Ontario mostly mentioned demand-focused policies. As shown in Figure 11, the cap-and-trade (in carbon pricing category) was the policy most mentioned with 48% of total mentions although with a mix of positive, negative, and neutral mentions. These results suggest that the cap-and-trade

was a policy subject to different framing between 2008 and 2018. The government also frequently stated positive mentions of other demand-focused policies such as charging infrastructure deployment and financial incentives.

Proportions (%) of mentions (N=53)
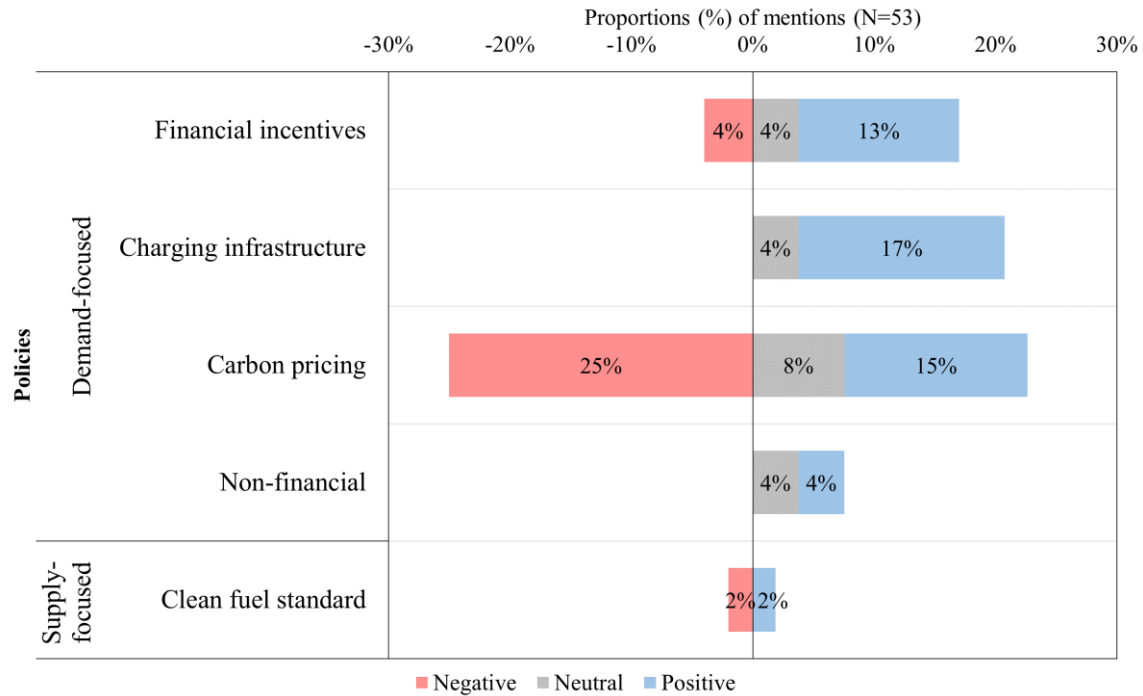


**Figure 11.     Proportions of policy mentions from the provincial government in Ontario newspaper coverage between 2008-2018.**

The other actors in Ontario including opposing political parties all frequently mentioned demand-focused policies but with some differentiation in the framing of financial incentives and the cap-and-trade, as shown in Figure 12. For instance, the automobile industry mostly mentioned financial incentives with 38% of total mentions but with a mix of positive (19%) and negative (14%) mentions. Advocacy groups and experts mostly mentioned the cap-and-trade and most of those mentions are positive. Similar to BC, experts mostly stated negative mentions of financial incentives. Lastly, opposing political parties frequently mentioned the cap-and-trade (47% of mentions) and financial incentives (31% of mentions) but with a mix of positive and negative mentions. The results in Figures 11 and 12 suggest that the government and other actors in Ontario mostly mentioned financial incentives and a cap-and-trade although with more variations in the framing of those policies than in BC and Québec.
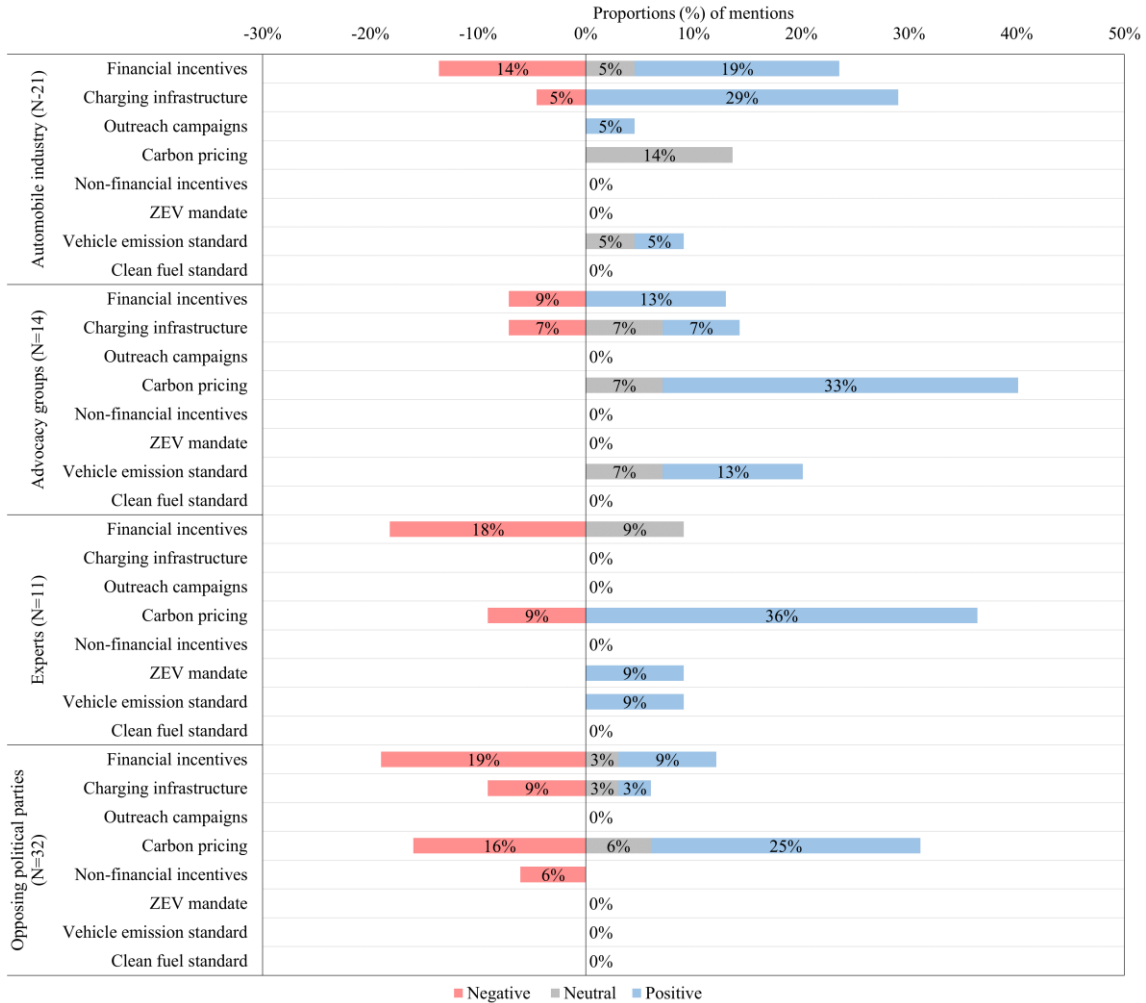
**Figure 12.** Proportions of policy mentions from the automobile industry, advocacy groups, and opposing political parties in Ontario newspaper coverage between 2008-2018.

## 3.3. Québec media content analysis

Similar to BC and Ontario, the government in Québec has fewer mentions of PEV frames (N=11) compared to the other actors. These low numbers of mentions are significant and suggest that PEV frames have only been mentioned (in newspaper coverage) a few times by the three governments over the decade 2008-2018. As shown in Figure 13, I found 11 mentions of PEV frames from the Québec government that mostly mentioned positive and societal frames, and especially the environmental frame. Similar to the BC government, it also mentioned some private and negative frames.

Mentions of frames (N=11)

| | | | |
|---|---|---|---|
| Financial | Negative 1 | |
| Performance | Negative 1 | |
| Convenience | Negative 1 | Positive 1 |
| Identity | 0 | |
| Others | 0 | |
| Environment | | Positive 4 |
| Economic | 0 | |
| Innovation | | Positive 1 |
| Others | | Positive 2 |

■ Negative ■ Positive
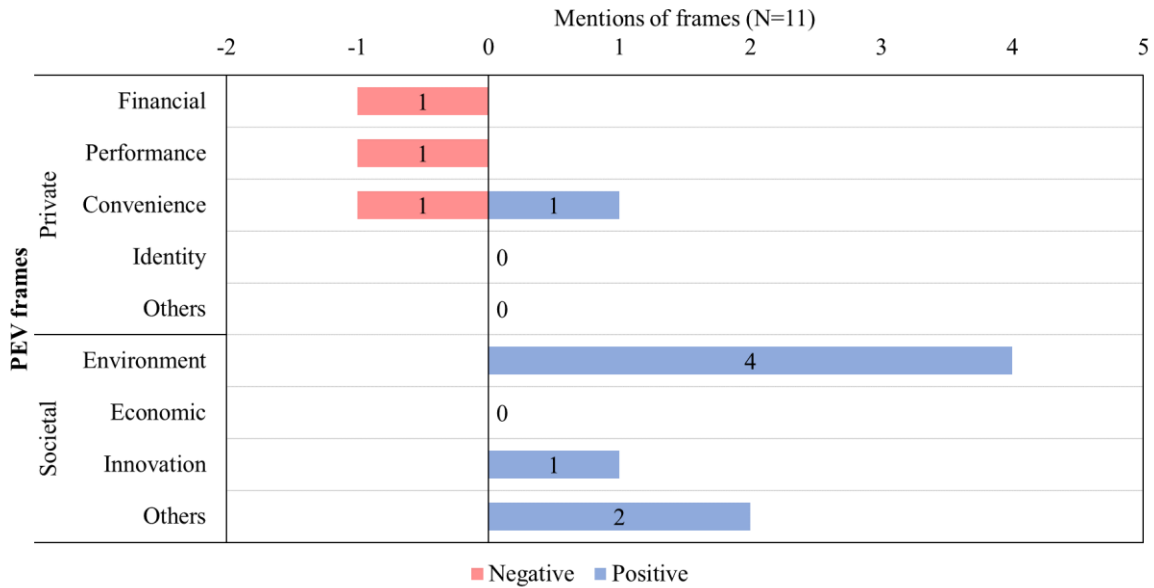
**Figure 13.    Mentions of PEV frames by the provincial government in Québec newspaper coverage between 2008-2018.**

As shown in Figure 14, the automobile industry and advocacy groups mostly mentioned positive frames while experts mostly mentioned negative frames of PEVs. However, all three actor categories mostly mentioned private frames. In Québec, the main advocacy groups are Équiterre, Electric Mobility Canada, and the Québec Electric Vehicle Association (AVÉQ). First, similar to the other provinces, the automobile industry mostly mentioned private frames (70% of mentions) but differently, it mostly mentioned positive frames (60%). For instance, it mentioned the financial frame with 19% of mentions and most are positive. Second, advocacy groups in Québec frequently mentioned private frames (69%) and positive frames (88%). Especially, advocacy groups focused on positive mentions of the financial, performance, and environmental frames. Therefore, both the automobile industry and advocacy groups focused on private frames but mostly mentioned positive frames. Third, experts also frequently mentioned private frames (63%) but mostly mentioned negative frames such as the performance frame. Therefore, like in BC and Ontario, other actors in Québec mostly mentioned private frames over societal frames. However, the automobile industry and advocacy groups mentioned more positive frames of PEVs in Québec's newspaper coverage than the same actors in the other provinces.
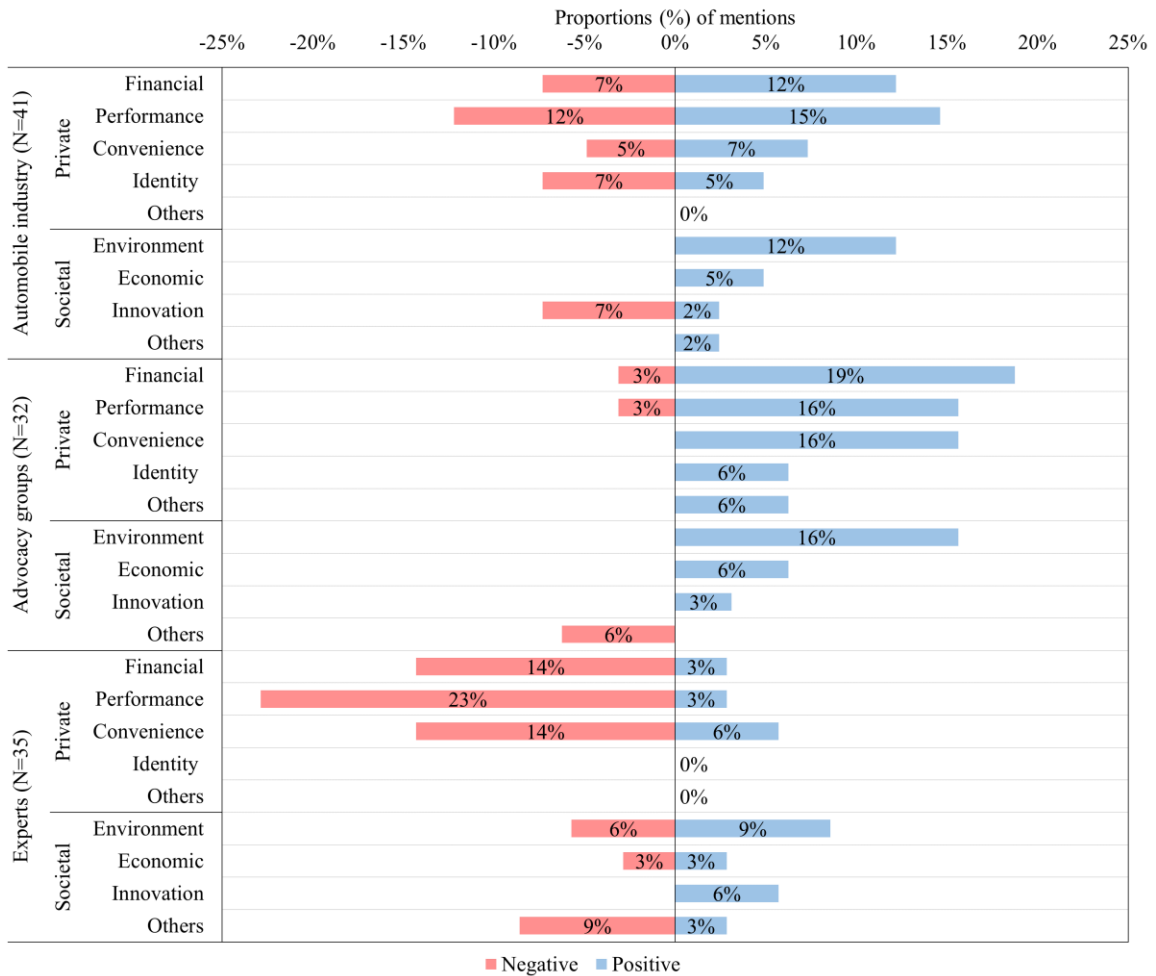
**Figure 14.** **Proportions of PEV frames mentions from the automobile industry, advocacy groups, and experts in Québec newspaper coverage between 2008-2018.**

In contrast with the governments of BC and Ontario, the government in Québec mostly mentioned a supply-focused policy namely the ZEV mandate with 50% of mentions and most (33% of total) are positive. The provincial government also mentioned demand-focused policies, such as financial incentives with 34% of mentions. In Québec, this policy category includes mentions of a "*bonus-malus*" (i.e., feebate), which adds a tax to gasoline vehicles (and exempt PEVs) to increase the cost-competitiveness of PEVs.
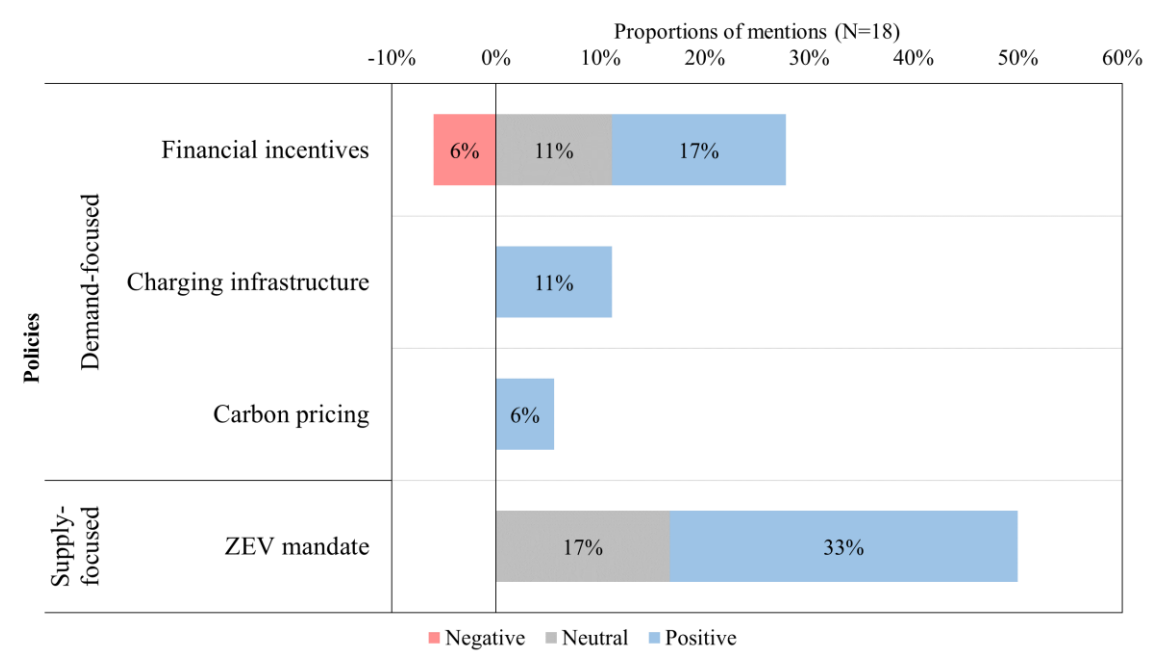
**Figure 15.** Proportions of policy mentions by the provincial government in Québec newspaper coverage between 2008-2018.

Similar to the policy mentions of the provincial government, the automobile industry and advocacy groups in Québec mostly mentioned the ZEV mandate although with variations in framing. In Figure 16, results show that the automobile mentioned the ZEV mandate with 42% of mentions and most (33% of total) are negative. Differently, advocacy groups mentioned the ZEV mandate with 34% of total mentions and most (30% of total) are positive. Similar to BC and Ontario, experts in Québec frequently mentioned financial incentives with 74% of total mentions and most (39% of total) are negative. These results suggest that the provincial government and advocacy groups mostly mentioned positive frames of a ZEV mandate whereas the automobile industry focused on a negative framing of the policy. These results differ from BC and Ontario where governments and other actors mostly mentioned demand-focused policies.
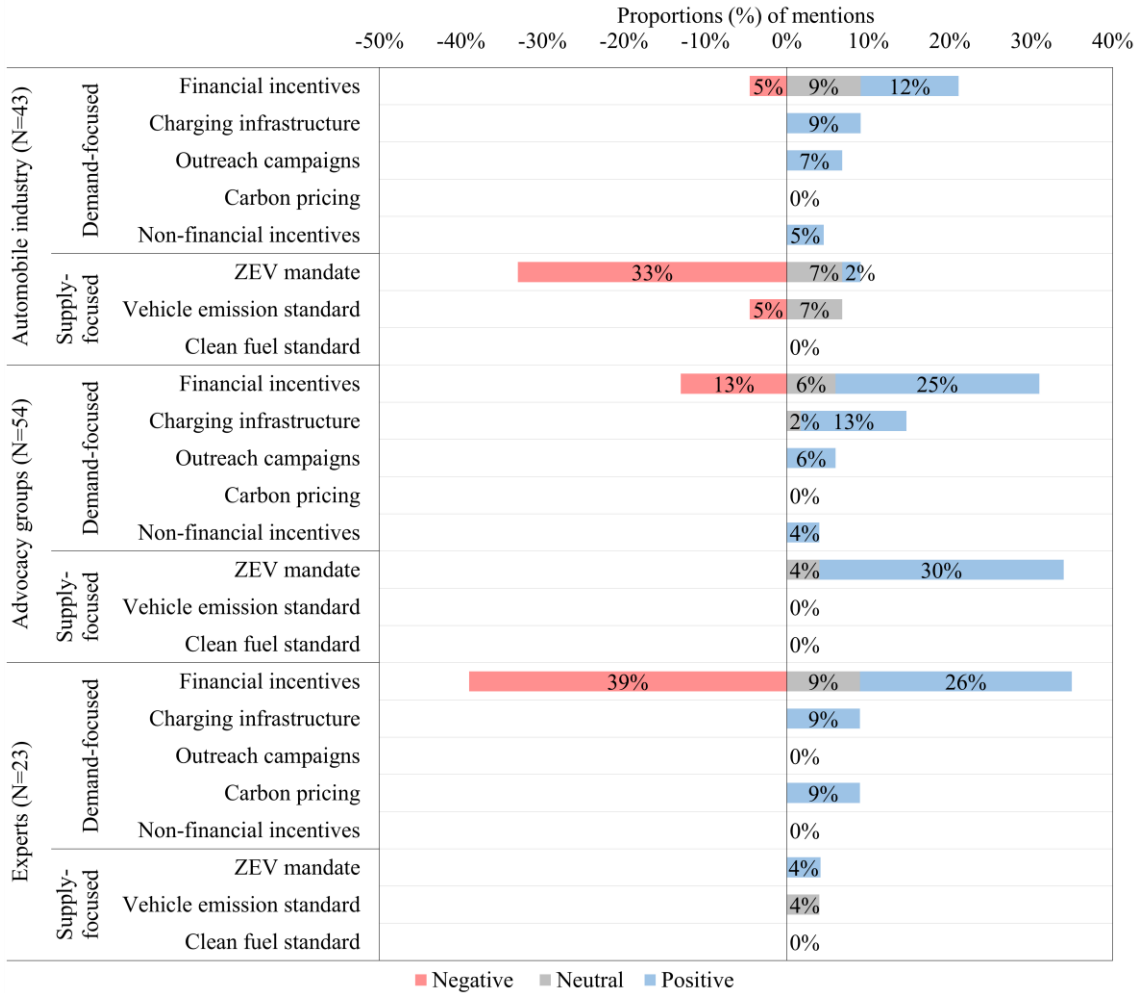
**Figure 16.** **Proportions of policy frames mentioned by the automobile industry, advocacy groups, and experts in Québec newspaper coverage between 2008-2018.**

## 3.4. Similarities and differences in the content media analyses of BC, Ontario, and Québec

In this section, I compare the similarities and differences that I observed from the content media analysis results across the three provinces, which are summarized in Table 5.

**Table 5.** Similarities and differences from the content analysis across case studies

| Actor category | Patterns common to all provinces | Differences across provinces | | |
|---|---|---|---|---|
| | | BC | Ontario | Québec |
| **Government** | Most mentions of positive and societal PEV frames | Mostly positive mentions of demand-focused policies | Mix of positive and negative mentions of demand-focused policies | Mostly positive mentions of supply-focused policies: ZEV mandate |
| **Other actors** | | | | |
| **General trends** | Most mentions of private PEV frames | Most mentions of demand-focused policies | Mix of positive and negative mentions of demand-focused policies | Mix of positive and negative mentions of the ZEV mandate |
| **Automobile industry** | | Mostly positive mentions of demand-focused policies | Mix of positive and negative mentions of demand-focused policies | Negative mentions of the ZEV Mandate |
| **Advocacy groups** | | Positive mentions of demand-focused policies | Mix of positive and negative mentions of demand-focused policies | Mix of positive and negative mentions of demand-focused policies |
| **Experts** | | Mostly negative mentions of financial incentives | Negative mentions of financial incentives | Mix of positive and negative mentions of financial incentives |

| | | | |
|---|---|---|---|
| **Opposing political groups** | - | Mix of positive and negative mentions of financial incentives and cap-and-trade | - |

I found two main similarities across the three case studies. First, as expected, the three provincial governments mostly mentioned PEVs with positive societal frames and especially the environmental and economic frames. However, the governments of BC and Québec also mentioned some negative private frames such as the financial and performance frames. Second, the other actors in all three provinces mostly mentioned private frames of PEVs except experts in BC that mostly (67%) mentioned societal frames. Thus, as shown in Figure 17, governments emphasized a societal (and positive) framing of PEV technology whereas the other actors emphasized a private framing.
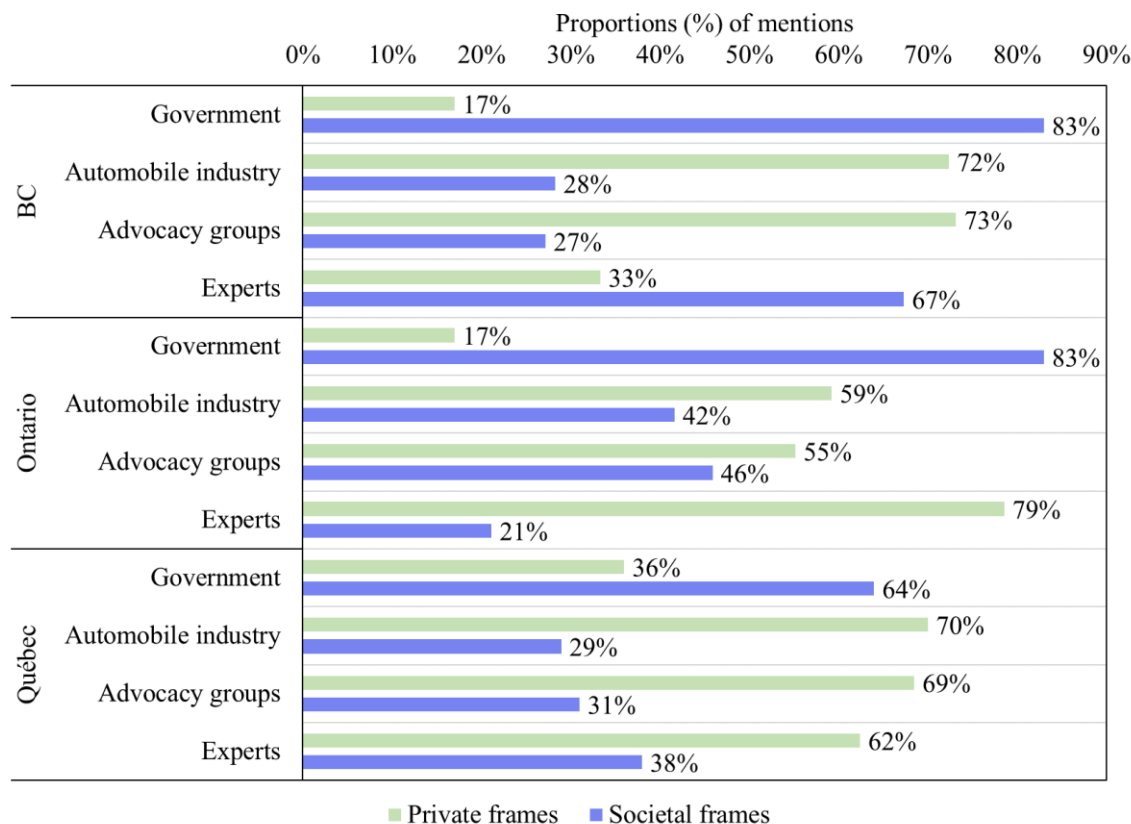


**Figure 17.      Distribution of private and societal PEV frames by actor category in each region.**

As summarized in Table 5, I also found some differentiation between the three case studies. First, compared to BC and Québec, I found a distinct distribution of actor category in Ontario. As shown in Figure 4, actors from opposing political parties in Ontario have more mentions (34 mentions including 32 mentions of policy) than in the other provinces (2 mentions in BC, and 21 mentions in Québec). Additionally, the provincial government in Ontario has overall more mentions (N=65) than in BC (N=21) and Québec (N=29). These results suggest that political actors (both from the government and the opposition) were more dominant in the Ontario newspaper coverage than the two other provinces, which supports my expectation to find more controversy in this province during this time period (further discussed in Section 4.2). Further, the automobile industry in Ontario has fewer statements (N=60) than BC (N=94) and Québec (N=84).

Second, there are differences in the policies mentioned by the governments. Specifically, the governments of BC and Ontario frequently mentioned demand-focused policies whereas the government of Québec mostly mentioned supply-focused policies and specifically the ZEV Mandate. These results suggest that even if Québec implemented similar demand-focused policies as BC and Ontario (e.g., financial incentives and charging station development), the government statements mostly focused on a ZEV mandate, which was announced in 2016 but took effect as of January 2018. In contrast, the BC government did not mention a ZEV mandate during the time period, even though it announced one in 2018 (but was only in effect as of May 2019, after the study period). In other words, while the announcement of a ZEV mandate came later in BC (in 2018) than Québec (in 2016), I did not find any mention of such policy from the BC government between 2008 and 2018.

Third, similar to the provincial governments in BC and Ontario, the other actors in the same regions mostly mentioned demand-focused policies whereas, in Québec, they frequently mentioned a ZEV mandate. Specifically, the automobile industry and advocacy groups in BC mostly mentioned positive frames of demand-focused policies. Similarly, the other actors in Ontario also mostly mentioned demand-focused policies although with a mix of positive and negative mentions. In contrast, in Québec, the ZEV mandate was the most mentioned policy by the other actors. Specifically, the ZEV mandate was mentioned mostly positively by advocacy groups but mostly negatively by

the automobile industry. However, similar to all three case studies, experts mostly stated negative mentions of financial incentives.

As mentioned in Chapter 2, the content analysis is the first step towards an in-depth examination of the statements retrieved in the newspaper coverage. Given that the results from the content media analysis quantify patterns and frequencies retrieved from statements, they do not provide a comprehensive analysis of the meaning of these statements. However, these quantitative results provide a general understanding of my research problem and structure to my second analysis (discourse analysis). In the next chapter, I aim to shed light on these results by conducting an in-depth and richer analysis of the statements.

# Chapter 4.

# Discourse media analysis results

In this chapter, I further analyze the statements retrieved in newspaper coverage to explore the use of storylines in the PEV policy discourse of the three case studies. As described in Chapter 1, I define discourse as language-in-use that governments and other actors use to debate and create meaning around PEVs and PEV policies. In the next sections of this chapter, I present three PEV policy discourses, one discourse per region, and the storylines that characterize these discourses. To analyze discourse, I conducted a qualitative discourse analysis by analyzing all statements from governments and other actors that appeared in my selection of newspaper articles and then used representative statements to illustrate the storylines. As a reminder, a storyline is a simplification of reality in which frames are united to promote issues in a particular manner (essentially pulling together some of the frames identified in Chapter 3). In addition to statements, I also analyze articles written by a representative to explore further the storylines put forth by actors. As mentioned in Chapter 2, statements from opinion articles were not coded quantitatively considering that the content of these articles was filtered through the view of one individual. Through discourse analysis, I used my interpretation and explored words and frames and how they unify to present a simplified narrative, a storyline, of PEVs and PEV policy. In Table 6, I summarize the storylines and the actors promoting them in the three case studies.

Next, I discuss the PEV policy discourses in BC, Ontario, and Québec by first exploring the storyline put forth by each government, and second, identifying which actor did or did not adopt that storyline through discourse coalitions. Drawing from Hajer (2002), I define a discourse coalition as a group of actors that share a common understanding of an issue. The formation of discourse coalitions is a dynamic and continuous process in which the interests of actors are reflected but can also be changed or reinforced over time. Finally, I compare the similarities and differences found in the PEV policy discourses, as outlined by my third research objective.

**Table 6.**     **Summary table of the storylines in BC, Ontario, and Québec**

|  | Storylines titles | Description | Discourse coalitions |
|---|---|---|---|
| **British Columbia** | *Incentives for climate* | PEVs are needed to meet climate goals and demand-focused policies are the most effective way | Government, Advocacy groups |
|  | *Regulations for climate* | PEVs are needed to meet climate goals and effective regulations are required such as a ZEV mandate, not financial incentives | Experts |
|  | *Carrot, not stick* | PEV policy approach should favor demand-focused policies (carrot) over supply-focused policies (stick) | Automobile industry (i.e., NCDA) |
| **Ontario** | *Green economy* | PEVs are vital for the green economy and society needs policies to help this transition | Government (i.e., Liberal party) |
|  | *Policies for the rich* | PEV policies are economically harmful to consumers and society | Opposing political parties (i.e., Progressive Conservative party) |
| **Québec** | *Forcing PEVs for economic independence (i.e., Independence,* for short*)* | PEVs are tools to reach climate goals and economic independence from fossil fuels thus society needs to force the industry to offer more PEVs | Government, Advocacy groups, Experts |
|  | *ZEV mandate distorts the market* | PEV policies can help but they should be demand-focused over a ZEV mandate because supply-focused policies will hurt the automobile industry | Automobile industry |

## 4.1. Policy discourse in British Columbia: The *Incentives for climate*, *Regulations for climate*, and *Carrot, not stick* storylines

As detailed in Section 1.4., between 2008 and 2018, PEV policies in British Columbia have focused on a demand-focused approach starting in 2011 with the introduction of financial incentives, investment in charging stations, and non-financial incentives such as free parking and access to HOV lanes. Other policies such as a carbon tax and a clean fuel regulation (LCFS) have also been in place in the province since 2008. In late 2018, the BC government announced that it would implement a ZEV mandate but only legislated the policy in 2019. In the BC newspaper coverage, I found three storylines, all framed to meet climate goals: *Incentives for climate*, *Regulations for climate*, and *Carrot, not stick*. Next, I use illustrative statements to discuss these storylines and shed light on the PEV policy discourse in BC.

The *Incentives for climate* storyline is put forth by the BC government to promote PEVs, or "clean energy vehicles", as a solution for reducing GHGs while also acknowledging important barriers to adoption. As shown in Statements 1 and 2, this storyline argues that for PEVs to be adopted and to play their role in reducing pollution, policies must first address their private drawbacks. These findings align with the results from the content analysis that showed that the provincial government frequently mentioned societal benefits while recognizing some private drawbacks (Figure 5).

> "[...] *electric vehicles still carry a premium of about 25 per cent on prices* [...] *and the program* (financial incentives) *aims at breaking down that barrier.*"
> **Statement 1: Minister of Energy and Mines Bill Bennett (Vancouver Sun, March 23rd, 2015)**

> "*If we want British Columbians to be part of the solution for reducing air pollution, we need to make clean energy vehicles more affordable, available and convenient.*"
> **Statement 2: BC Premier, John Horgan (The Province, November 21st, 2018)**

Given that PEVs are framed as a way to reduce emissions, the *Incentives for climate* storyline promotes PEV policies as part of broader climate targets. For instance, the demand-focused policies introduced in 2011 (i.e., financial incentives and charging station development) aimed to increase PEV adoption and reduce GHG emissions to

move towards a "*future of B.C. transportation* (that) *looks very green*" (Environment Minister Terry Lake, The Province, November 6th, 2011). Therefore, switching to PEVs and implementing demand-focused policies was promoted by the government as an opportunity to bring important environmental benefits to the province, as shown in Statement 3. However, similar to the results of the content analysis, the government remained absent from a discussion around a ZEV mandate.

> "(Financial incentives are) *the most effective way to reduce greenhouse emissions.*"
> **Statement 3: Minister of Energy and Mines Bill Bennett (The Province, January 22nd, 2016)**

Advocacy groups share similar policy interests with the *Incentives for climate* storyline that focuses on demand-focused policies, but some NGOs also propose other policies to increase PEV uptake. For instance, Clean Energy Canada stated that *"[...] there are other policy tools that B.C. could use to increase EV numbers, such as adopting a zero-emission vehicle standard similar to the state of California*" (The Vancouver Sun, August 11th, 2017). However, as shown in the content analysis (Figure 8), this actor category mostly promotes demand-focused policies such as financial incentives and access to HOV lanes to increase the number of PEVs on the road and reduce emissions, as shown in Statements 4 and 5:

> "*If B.C.'s goal is to become the leading adopter of EVs in Canada, then the incentives are important, because the rate of growth has dropped.*"
> **Statement 4: Jim Vanderwal, Fraser Basin Council (The Province, October 14th, 2014)**

> "*The goal of both HOV lanes and EVs is to reduce the production of greenhouse gases. HOV lane access will attract EV adopters and reduce GHG emissions."*
> **Statement 5: Vancouver Electric Vehicle Association (The Province, May 1st, 2015)**

Moreover, the *Incentives for climate* storyline implies that consumers should not have to change their values or preference regarding PEV technology. By implementing policies that reduce the private barriers associated with PEVs, the government aims to make PEVs attractive to consumers. For instance, the goals behind the introduction of

financial incentives and charging stations were to overcome the obstacles to the widespread adoption of PEVs and especially the high costs, limited infrastructure, and the lack of awareness and knowledge of these technologies (Government of British Columbia, 2015). Statement 6 highlights how the *Incentives for climate* storyline enticed consumers to adopt PEVs yet without forcing them to change their values or preferences (i.e., valuing environmental benefits more than private values).

> *"These programs offer several opportunities for British Columbians to participate in B.C.'s clean energy future."*
>
> **Statement 6: Environment Minister Terry Lake (The Province, November 6th, 2011)**

I identified a second storyline that is put forth by the expert actor category, which I call *Regulations for climate*. Similar to the *Incentives for climate* storyline, this storyline also framed PEVs and PEV policy within the broader climate and "clean energy" goals. However, as illustrated in Statement 7, the *Regulations for climate* storyline advocates a more "effective" policy approach. As shown from the results of the content analysis (Figure 8), experts mostly stated negative mentions of financial incentives and some positive mentions of supply-focused policies, such as a ZEV mandate. From the experts' view, demand-focused policies are "*more symbolic*" than effective in driving PEV uptake (Researcher, Simon Fraser University, The Province, November 16th, 2016). Specifically, financial incentives are perceived as "*failing to produce environmental benefits*" (Researcher, University of British Columbia, Vancouver Sun, August 8th, 2009). Therefore, the *Regulations for climate* storyline advocate for "effective policies" such as a ZEV mandate, as highlighted in Statement 7:

> *"While* (the government) *had a number of strong policies it did not enact zero emission vehicle legislation, which was recently introduced in Quebec and can be effective in encouraging adoption of electric vehicles. The current government just hasn't demonstrated the appetite to put in a really effective policy. The transition to electric vehicles isn't going to happen by itself. It has to be driven by policy."*
>
> **Statement 7: Researcher, Simon Fraser University, The Province, November 16th, 2016**

The third storyline, which I named *Carrot, not stick*, is promoted by actors from the automobile industry category, especially the New Cars Dealers Association of British

Columbia (NCDA). As mentioned earlier, in BC newspaper coverage, 33% (N=122 articles) of the total articles retrieved were articles written by the President of the NCDA, Blair Qualey. The NCDA represents more than 390 automobile dealers throughout the province and is involved in the implementation of financial incentives since 2011. The results from the content media analysis show that the automobile industry mostly stated positive mentions of demand-focused policies such as financial incentives and information campaigns (see Figure 8), which aligns with Statement 8. However, the qualitative analysis of articles written on behalf of the NCDA revealed further insights on the storyline put forth by this industry.

> "*To that end, the NCDA remains a strong advocate of the current approach that is based on incentives and education, because further adoption of clean energy vehicles is good for the economy, the environment and current and future British Columbians.*"
> **Statement 8: Blair Qualey, The Province, September 21st, 2018**

Through the *Carrot, not stick* storyline, the NCDA promoted a policy approach that favors a reward, a "carrot", rather than a negative consequence, "a stick". In other words, this metaphor reflects the NCDA opposition to a ZEV mandate arguing that it would "*hurt both consumers and businesses*" (The Province, April 29th, 2016). Statement 9 shows how the *Carrot, not stick* storyline emphasized PEVs' private drawbacks to promote an approach focused on demand-focused policies over supply-focused policies.

> "*[...] (a ZEV mandate) is of concern because it does not take a number of key factors into account. These include the fact EVs are still unaffordable [...]; EV is not a realistic option for many families or businesses; a comprehensive network of charging stations is critical to support increased EV adoption [...] and finally, there is no recognition that newer model gasoline vehicles can also play an important role in emission reductions.*"
> **Statement 9: Vancouver Sun, November 30th, 2018**

In short, all three storylines support PEV policies, and general climate and clean energy goals. While government, advocacy groups, and the automobile industry support demand-focused policies, experts do not favor financial incentives. Additionally, experts and the automobile industry (i.e., NCDA) provide opposite positions on supply-focused policy (ZEV mandate), while the provincial government remained conspicuously silent on the issue during the time period.

## 4.2. Policy discourse in Ontario: The *Green economy* and *Policies for the rich* storylines

Similar to BC, the main PEV policies implemented in Ontario during the time period are demand-focused policies such as financial incentives, charging station development, and the province's adherence to the North American cap-and-trade system. In 2018, the newly elected government led by the Progressive Conservative (PC) party canceled the cap-and-trade, which funded financial incentives. In Ontario newspaper coverage, I found two competing storylines promoted by opposing political parties: the *Green economy* storyline put forth by the Liberal party and the *Policies for the rich* storyline put forth by the PC party. Next, I describe these two conflicting storylines that divided the PEV policy discourse in Ontario and suggest that PEV policy in that province was embedded within larger political debates between parties.

From 2008 to early 2018, the Liberal government in Ontario promoted the *Green economy* storyline that framed PEVs as vital to mitigate climate change and as an economic opportunity for the local automobile industry. The importance of this industry within Ontario's economy makes it a unique characteristic of the PEV policy discourse in this province. Statement 10 illustrates how the *Green economy* storyline emphasized the environmental benefits but also PEVs' social and economic benefits to the automobile industry.

"*Encouraging Ontarians to choose EVs is part of our government's plan to reduce greenhouse gas emissions and create jobs* [...] *it's important for us to encourage motorists to embrace electric vehicles* [...] *because it protects and supports our vibrant communities and contributes to a high quality of life.*"
**Statement 10: Transportation Minister Rob Chiarelli (Toronto Star, May 5th, 2012)**

Similarly, Statements 11 and 12 illustrate how the *Green economy* storyline promoted the positive environmental and economic impacts of PEV demand-focused policies.

*"Like many other jurisdictions across North America serious about reducing greenhouse gas pollution, tackling climate change and encouraging greener consumer choices, Ontario's electric vehicle rebate program helps drivers make a more environmentally sustainable decision when purchasing an automobile."*

**Statement 11: Transportation Minister Steven Del Duca (Toronto Sun, April 12<sup>th</sup>, 2015)**

*"(charging stations) could be good for the automotive business, which is a key driver of the provincial economy."*

**Statement 12: Economic Development and Infrastructure Minister Brad Duguid (Toronto Star, November 9<sup>th</sup>, 2015)**

Similar to the BC government storyline, the *Green economy* storyline framed PEV policy in a way to minimize consumers' changes in values and preferences. Again, this implies that the government is not forcing consumers to change their preferences regarding PEVs but is trying to make the technology attractive and competitive in a free market. In other words, governments wish to "encourage" consumers to buy PEVs by making them more appealing (i.e., reduced cost, more charging stations, etc.) While the results from the content analysis show that the government did not specifically mention negative private frames (Figure 9), it nonetheless portrayed PEV policies to address private drawbacks, as shown by Statement 13:

*"By investing in charging infrastructure that is fast, reliable and affordable, we will encourage Ontarians to purchase EVs, reducing GHGs and keeping our air clean."*

**Statement 13: Transportation Minister Steven Del Duca (Toronto Star, November 9<sup>th</sup>, 2015)**

In contrast, the *Policies for the rich* storyline is defended by actors from opposing political parties, mainly the Progressive Conservative party. While still supporting efforts to tackle climate change, this storyline directly opposes the storyline put forth by the Liberals. Contrary to the *Green economy* storyline, this second storyline framed PEVs as "luxury cars" and PEV policy as economically negative for both consumers and society, as shown in Statement 14:

"(financial incentives" are just another expensive green "schemes" by the Ontario Liberals that is failing to meet their objectives. It was an aspirational goal, a stretch goal. It's a waste of taxpayer's money."

**Statement 14: Progressive Conservative Michael Harris (Toronto Sun, September 10<sup>th</sup>, 2017)**

Specifically, financial incentives were labeled a "*rich electric car subsidy*" and a "*rebate program for millionaires*", which is also illustrated in Statement 15:

"*If somebody can afford to pay $35,000, they don't need a subsidy. The person helping to pay that subsidy could be the neighbor next door who can't afford an electric car.*"

**Statement 15: Progressive Conservative Frank Klees, (Toronto Star, June 19th, 2010)**

Moreover, as shown in Statement 16, the cap-and-trade (which funded PEV financial incentives) was mainly portrayed as a "*cash grab*" and a way of "subsidizing the wealthy" with no effect on the environment and negative financial impacts on society and individuals (PC leader Patrick Brown, The Toronto Star, September 23rd, 2017).

"*Every cent spent from the cap-and-trade slush fund is money that has been taken out of the pockets of Ontario families and businesses* [...] *We believe that this money belongs back in the pockets of people.* [...] *Cap-and-trade and carbon tax schemes are no more than government cash grabs that do nothing for the environment while hitting people in the wallet to fund big government programs.*"

**Statement 16: Progressive Conservative candidate, Doug Ford (Toronto Star, July 24th, 2018)**

Given that the two storylines described above oppose each other, I found the actors from the automobile industry, advocacy groups, and experts categories to be more polarized between the two storylines than the same actors in the other provinces. In other words, the other actors in Ontario mentioned statements that aligned with either the *Green economy* or the *Policies for the rich* storyline. For instance, actors from the automobile industry category either opposed (Statement 17) or promoted (Statement 18) PEV policies.

"*One in every 20 cars adds up to about 350,000 electric vehicles on the road by 2020. At $10,000 apiece in rebates, that means the province is looking at a $3.5 billion program. It is foolish policy. It is misdirected, not thoroughly thought through. There is much more the Ontario government can do to green the auto sector.*"

**Statement 17: Dennis Desrosiers, Automobile analyst (Toronto Star, July 16th, 2009)**

"[...] *there are three pillars required for adoption of EVs by consumers - the ongoing need for consumer incentives, continued expansion of recharging infrastructure and public education that electric vehicles are an option for their transportation needs.*"

**Statement 18: Mark Nantais, President of the Canadian Vehicle Manufacturers' Association (Toronto Sun, December 26th, 2018)**

These variations are similar to the results from the content analysis (Figure 12) where these actors frequently mentioned demand-focused policies yet with a mix of positive, negative, and neutral mentions. Therefore, unlike BC and Québec, other actors in Ontario are more heterogeneous and seem to be divided between the *Green economy* and the *Policies for the rich* storyline.

In short, the two storylines are put forth by opposing political parties and dispute one another. While the Liberal government supports demand-focused policies to increase PEV uptake and transition towards a green economy, the PC party opposes these demand-focused policies. Additionally, the other actors in Ontario seem more polarized between the two storylines, resulting in a PEV policy discourse separated between the *Green economy* and the *Policies for the rich* storylines. These two conflicting storylines might also reflect the broader political differences promoted by each political party, a finding unique to the context of Ontario.

## 4.3. Policy discourse in Québec: The *Forcing PEVs for economic independence* and *ZEV mandate distorts the market* storylines

As mentioned earlier, Québec differs from the two other provinces culturally and politically, and also given that it was the first Canadian province to use supply-focused policies to induce PEV adoption, namely a ZEV mandate. While it also implemented demand-focused policies starting in 2012, the provincial government announced a ZEV mandate in 2016, which was only in effect in 2018. Additionally, Québec was the first Canadian province to introduce a cap-and-trade in 2013. During my analysis, I found two storylines, both focused on a ZEV mandate although with distinctive perspectives: *Forcing PEVs for economic independence* (i.e. *Independence* storyline for short) and *ZEV mandate distorts the market*. Next, I discuss these two storylines to shed light on the PEV policy discourse in the French-speaking Canadian province.

The first storyline, which I call the *Forcing PEVs for economic independence* storyline, is put forth by the provincial government that represented PEVs not only as a means for emission reduction but also as an opportunity to reduce oil imports and fossil fuel dependence. This ambition towards economic independence is unique to the Québec policy discourse. As shown in Statements 19 and 20, PEVs are perceived as a way to utilize Québec's hydroelectricity and transition towards a low-carbon economy.

"*Jean Charest argued that the shift to the electric car will reduce greenhouse gas emissions in addition to reducing imports of petroleum products.*"[2]
**Statement 19: Québec Premier, Jean Charest (La Presse, April 7th, 2011)**

"*Beyond the environmental challenges, the electrification of transportation is also a way of favoring Québec's electricity over foreign oil. This is economic nationalism!*"
**Statement 20: Québec Premier, Phillippe Couillard (Le Devoir, September 17th, 2018)**

Similar to the government's storyline in the other provinces, the *Independence* storyline prioritizes consumer values by promoting policies as needed to address PEVs' private barriers, as shown in Statement 21.

*"We must be realistic in changing consumer habits. When I speak to citizens, they say to me: yes, I would very much like to buy an electric vehicle, but I would need a little more range and that the prices are a little lower."*
**Statement 21: Premier, Philippe Couillard (Le Devoir, September 17th, 2018)**

While the *Independence* storyline promoted several PEV policies such as financial incentives, it mainly focused on a supply-focused policy approach and the implementation of a ZEV mandate. Also found in the content analysis (Figure 15), this focus on a ZEV mandate is unique to the policy discourse in Québec and a contrast to the other provinces. Specifically, this finding differs from the *Incentives for climate* storyline put forth by the BC government, which announced a ZEV mandate in 2018 yet remained silent on this issue (in newspaper coverage) during the time period. Moreover, the *Independence* storyline strongly emphasized the role the automobile industry had to

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[2] All statements in this section have been directly translated from French by Audrey Aubertin.

play in PEV uptake. Statement 22 demonstrates the willingness of Québec to target the automobile industry and "force it" to comply with a ZEV mandate:

*"To reach this target of 100,000 plug-in electric and hybrid vehicles, it will be necessary to force the automotive industry to offer more cars of this kind. We will force it. There is a will, but one cannot imagine that [this objective] will be realized [this objective] by simply expressing a wish. We will have to go further than that."*
**Statement 22: Transportation Minister Jacques Daoust (La Presse, February 2<sup>nd</sup>, 2018)**

Actors from the advocacy groups and experts' categories in Québec share similar policy interests with the *Independence* storyline put forth by the government. As shown in Statement 23, both actor categories agree with the government on the role PEVs can play in fossil fuel and economic independence.

"*People from different regions are often really proud to drive an electric car and to use renewable energy produced here rather than encouraging the fossil fuel industry.*"
**Statement 23: AVEQ President, Simon-Pierre Rioux (La Presse, January 16th, 2016)**

Additionally, advocates also support PEV policies that "*go beyond charging infrastructure and incentives*" as "*the priority is to increase the supply* (of PEVs)" (Québec Electric Vehicle Association (AVEQ) President, Pierre Rioux, Le Devoir, September 14<sup>th</sup>, 2015). Therefore, advocacy groups and experts support policies that force the automobile industry to offer more PEVs such as a ZEV mandate.

Further, similar to experts in BC and Ontario, experts (and some advocates) in Québec framed financial incentives as ineffective to achieve the province's climate targets, as shown in Statements 24 and 25.

"*The only way to have access to all models is to force automakers to offer them through a ZEV mandate. The Québec policy in favor of transport electrification, offering a financial incentive of $8000, is insufficient.*"
**Statement 24: Founder of electric car advocacy site, Sylvain Juteau (Le Devoir, October 14<sup>th</sup>, 2014)**

"*It is clear that the $8000 financial incentives is insufficient to achieve the target of 100 000 electric vehicles on the road by 2020. This investment is completely inefficient with regards to the greenhouse gas reduction target because it does nothing to stop the growth of light passenger trucks from which Québec suffer.*"

**Statement 25: Hautes études commerciales (HEC) professor Pierre-Olivier Pineau (Le Devoir, January 9th, 2016)**

I found a second storyline, the *ZEV mandate distorts the market* storyline, promoted by actors from the automobile industry that oppose a ZEV mandate for economic reasons while supporting demand-focused policies. As shown in Statement 26, this storyline argues that a ZEV mandate would affect financially both consumers and the industry leading to "*market distortions*" (Global Automakers of Canada President, David Adams, Le Devoir, July 7th, 2017). Similar to the *Carrot, not stick* storyline in BC, this second storyline advocates for a collaborative approach with the provincial government based on demand-focused policies.

"*[...] we are not against EVs, our industry invests millions to develop this new technology. However, a ZEV mandate would have negative impacts on dealerships who would have to have in stock hundreds of vehicles and that could be very expensive. [...] We say no to a ZEV mandate, but yes to generous financial incentives, access to HOV lanes, free parking and free recharging.*"

**Statement 26: Canadian Association of Automakers President, Mark Nantais (Le Devoir, April 27th, 2015).**

In short, both storylines support PEVs and PEV policies but propose different positions regarding a ZEV mandate. The provincial government, advocacy groups, and experts support a ZEV mandate to force the automobile industry to offer more PEVs. In contrast, actors from the automobile industry category provide opposition to a ZEV mandate while supporting demand-focused policies. Finally, compared with BC and Ontario, the focus on a ZEV mandate is unique to the PEV policy discourse in Québec.

## 4.4. PEV policy discourse comparison

In the remainder of this chapter, I first discuss the similarities before reviewing the differences found in the three PEV policy discourses presented above.

In the three provinces, the storylines put forth by governments (*Incentives for climate* in BC, *Green economy* in Ontario, and *Forcing PEVs for economic independence* in Québec), framed PEV as a technology that can reduce GHGs emissions but that still carry private drawbacks. These insights align with the results from the content analysis from which all three governments frequently mentioned positive societal frames (BC= 5 mentions out of 8, Ontario= 10 mentions out of 12, Québec= 7 mentions out of 11). Additionally, I found that the three governments (except in the *Policies for the rich* storyline put forth by the PC government in Ontario) framed policies as needed to make PEVs attractive to consumers by prioritizing the reduction of private barriers to adoption. Thus, across the three case studies, governments acknowledged that PEVs can offer societal benefits, but they also have important private drawbacks and policies can address those drawbacks.

I also found a similarity between the storylines put forth by actors from the automobile industry category in British Columbia (*Carrot, not stick* storyline) and Québec (*ZEV mandate distorts the market* storyline). In both provinces, the automobile industry opposes the implementation of a ZEV mandate, claiming it would have negative economic impacts on their industry, the market, and consumers. Consequently, through these two storylines, actors from the automobile industry favor a demand-focused approach to policy that includes financial incentives, charging station development, and information campaigns. In contrast, actors from the automobile industry in Ontario seem to be more polarized between the two opposing storylines found in the PEV policy discourse of that province.

From the results described in this Chapter, I found that the three governments promote distinct rationales for the implementation of PEV policy. In BC, the *Incentives for climate* storyline mainly promotes demand-focused policies such as financial incentives as the most effective ways to reduce GHGs emissions. Similarly, in Ontario, the *Green economy* storyline emphasizes on a demand-focused policy approach to fight climate change, but also to make PEVs economically attractive to the automobile

industry. This storyline differs from the two others given that it reflects the importance of the auto industry in Ontario. Finally, in Québec, the *Forcing PEVs for economic independence* storyline positions PEV policy within the province's economic goals of reducing fossil fuel imports and consumption. Contrary to BC and Ontario, this storyline focuses on the implementation of a ZEV mandate over demand-focused policies, which is unique to the PEV policy discourse in Québec.

The PEV policy discourses in the three case studies also differ regarding the discourse coalitions formed by actors (which actor supported or opposed the storylines put forth by governments). In BC, the government and advocacy groups support demand-focused policies through the *Incentives for climate* storyline. The automobile industry (*Carrot, not stick* storyline) also advocates for demand-focused policies but firmly opposes a ZEV mandate. In contrast, experts do not favor financial incentives and argue for supply-focused policies (*Regulations for climate* storyline). In Ontario, two discourse coalitions are formed between actors from opposing political parties and their differing storylines: the Liberal party promoting the *Green economy* storyline and the PC party promoting the *Policies for the rich* storyline. In contrast to BC and Québec, the other actors in Ontario seem more polarized between these two discourse coalitions. In Québec, I found two discourse coalitions proposing different positions towards a ZEV mandate. Specifically, the government, advocacy groups, and experts promote supply-focused policies (*Forcing PEVs for economic independence* storyline) while the automobile industry opposes a ZEV mandate (*ZEV mandate distorts the market* storyline).

In contrast to the PEV policy discourses in BC and Québec, I found that the PEV policy discourse in Ontario is characterized by an opposition between political parties that resulted in the divergences found between the *Green economy* and the *Policies for the rich* storylines. The PEV policy discourses in BC and Québec are characterized by a political consensus over climate policies and PEV development. In these provinces, there does not seem to be any opposition to PEVs or the implementation of PEV policies. Conversely, while publicly supporting climate change mitigation, the *Policies for the rich* storyline put forth by the PC party in Ontario firmly opposes the *Green economy* storyline of the Liberal party by arguing for less government intervention regarding PEVs. Specifically, the *Policies for the rich* storyline promotes the cancellation of many PEV policies introduced by the Liberals. Therefore, these results suggest that the PEV

policy discourse in Ontario might be embedded within broader debates between opposing political parties, which I did not find in the other provinces.

I found another difference relative to the unique PEV policy discourse in Québec. Compared to the PEV policy discourses of BC and Ontario that emphasized demand-focused policies, the policy discourse in Québec focused on a policy that targets the automobile industry, a ZEV mandate. Specifically, the *Forcing PEVs for economic independence* storyline stands out because of the government's approach to PEV policy. To increase PEV uptake, the government wants to "force" the automobile industry to offer more PEVs and frame it as the only way to achieve significant change. Advocacy groups and experts share similar policy interests with this storyline as they similarly advocate for strong and effective policies. Conversely, the automobile industry (*ZEV mandate distorts the market* storyline) argues for demand-focused policies, not a ZEV mandate. Therefore, the PEV policy discourse in Québec is distinctive by its supply-focused approach to policy compared to BC and Ontario.

# Chapter 5.

# Discussion

This study aimed to shed light on PEV policy implementation in British Columbia, Ontario, and Québec by analyzing the way PEV technology and policies are framed by governments and actors in policy discourses. Specifically, I wished to answer the following research questions: what storyline do the different governments and other key actors (discourse coalitions) promote in the decade of 2008-2018? Do these storylines shed insight as to why each province implemented different PEV-supportive policies at different times? To that end, I applied a mixed-method approach to the analysis of mediated statements by conducting a content analysis followed by discourse analysis. Specifically, I examined statements mentioned by governments and other actors using the concepts of frames and storylines. To answer my first research objective, I analyzed which frames of PEVs and PEV policy were the most mentioned by governments and other actors. To answer my second research objective, I examined how statements united frames to portray PEVs and PEV policy in simplified storylines. Lastly, I compared the PEV policy discourses in the three case studies and identified similarities and differences, as outlined by my third research objective. Thus, in the previous Chapters, I aimed to answer my first research question and identify the storylines put forth by governments and actors in the decade of 2008-2018.

In this chapter, I aim to answer my second research question as to why governments may gravitate towards different policy approaches (demand-focused or supply-focused), at different times. Here, I aim to explore PEV policy implementation based on my results rather than present definitive conclusions and explanations. Specifically, I use results from both analyses (frames and storylines identified) to shed light on the different policy pathways of BC, Ontario, and Québec. Next, I discuss the key findings of this study: (1) while PEVs are framed as a mixed private-societal good, governments prioritized private consumers values in their framing of policy (in newspaper coverage), (2) how PEV policies are framed is closely linked to the socio-political context of a region, and especially economic factors related to the automobile and energy industries, and (3) the storylines from the automobile industry in BC and Québec advocate similar policy interests that favor demand-focused policies. Next, I summarize these main findings in

light of the literature reviewed in Chapter 1 and discuss how they can shed light on PEV policy implementation before explaining the limitations of the study and future research opportunities.

## 5.1. Frames of PEVs and policy in PEV policy discourse

This study supports the findings of past research illustrating that because PEVs carry many attributes with positive and negative impacts for the consumers and society, they can be defined as mixed private-public goods (Axsen & Kurani, 2012; Brown, 2001; Sovacool & Axsen, 2018). As described in Chapter 1, a mixed private-public good (in this study, a mixed private-societal good) is characterized by a combination of private and societal attributes, as exemplified by the PEV private-societal framework (Table 1). In the content analysis, I found that the three governments mostly mentioned societal frames relative to the environmental and economic benefits of transitioning to PEVs, which echoes with another study that found that environmental attributes were most mentioned in US newspapers (Pollak et al., 2006). However, the work of Pollak (2006) focused on media coverage (not statements) of HEV technology between 2002-2003. Moreover, I found that the governments in BC and Québec also mentioned some private drawbacks relative to the financial and performance frames. Therefore, by mentioning mostly societal frames but also some private frames, the three governments defined PEVs (in newspaper coverage) as a mixed private-societal good.

While framing PEV technology with both private and societal attributes, I found that the three governments prioritized private consumers' values when framing policy. In other words, when framing solely the technology, governments emphasized a societal framing, but when framing policy, governments emphasized private consumer values. During the decade 2008-2018, governments broadly framed PEV policy as part of larger climate goals but implemented policies mainly to address the private barriers to adoption and increase PEV uptake. For instance, in their storylines, governments framed PEV policies as tools that would reduce the costs, limited range, and inconvenience associated with PEV technology. This prioritization of consumer values is similar to the framing of the Californian ZEV program following CARB's revision in 1996 (Brown, 2001). As explained in Chapter 1, the first phase of the ZEV program (1990-1996) prioritized a framing of ZEVs around societal environmental benefits. This initial framing implied that citizens had to voluntarily change their preferences and purchase a ZEV,

based on the valuation of environmental benefits. However, the 1996 revision of the ZEV program changed how ZEV technology was framed by emphasizing range and cost (private framing) over environmental benefits (societal framing). By prioritizing a private framing of the technology, the ZEV program (1996 onwards) was no longer designed to require consumers to change their values or preferences regarding ZEVs but rather let the technology compete as another private mode of transportation in a free market (Brown, 2001).

The present study aligns with this prioritization of private consumer values in the framing of PEV policymaking. By implementing policies addressing private barriers, governments aim to encourage consumers to purchase a PEV (that meets private preferences) rather than forcing them to prioritize PEVs' societal benefits and choose PEV over another technology (change of preferences). Similar to Brown (2001), I argue that how policies are designed and framed convey an implicit framing of PEVs that becomes rooted within the collective understanding of PEV technology. Thus, by prioritizing consumer's values in the framing of PEV policy, PEVs are promoted mainly as a private good that needs to compete with other modes of transportation and meet consumer's private preferences. In short, in newspaper coverage, PEVs are defined by governments as a mixed private-societal good (mostly with societal benefits) but are framed in policy as needed to meet consumers' preferences.

Contrarily to governments, the other actors in the three case studies mostly mentioned private PEV frames (Figure 17). This concentration of private PEV frames in the statements retrieved from newspaper coverage is supported by US-based research suggesting that PEV technology in the media has been framed mostly around private attributes valued by consumers (Melton et al., 2016). However, the results from my study do not support the work of Pollak et al., (2006) that found that environmental attributes of HEVs (in media coverage) were more mentioned than performance, reliability, and safety (private attributes). Though, as mentioned earlier, both studies analyzed newspaper coverage in aggregate not the statements retrieved from actors. Nonetheless, these findings support the PEV definition of a mixed private-societal good. Thus, I argue that the emphasis on either the private or societal perspective used to frame PEVs depends on which interests are prioritized by a given actor (i.e., societal, or private interests).

As expected, governments mostly stated positive mentions of the PEV policies that were implemented in the regions between 2008 and 2018. However, in the 367 articles retrieved from the BC newspaper coverage, the BC government did not mention supply-focused policies such as the ZEV mandate (announced publicly in 2018 but implemented in 2019) nor the LCFS (implemented in 2010). However, I did not specifically search "ZEV mandate", "Low Carbon Fuel Standard", or "LCFS" during the data collection. Thus, the government might have mentioned these policies in other contexts (in newspapers), without mentioning the term PEV specifically. In contrast, the government in Québec mostly mentioned the ZEV mandate (announced publicly in 2016 and implemented in 2018) over demand-focused policies. As for Ontario, it mostly stated positive mentions of financial incentives and charging infrastructure but a mix of positive and negative mentions of the cap-and-trade. These variations in mentions of policy frames are discussed further next where I explore the PEV policy discourses to investigate potential explanations as to why governments in these regions implemented policies over others, during the time period.

## 5.2.  Variations in PEV policy discourses: the influence of socio-political factors

The results presented in Chapters 3 and 4 suggest that regional socio-political factors and especially economic factors related to the automobile and energy sectors influenced how governments (and other actors) framed PEV policy in their storylines. Next, I discuss how these socio-political influences may have impacted the formation of PEV policy discourse in each province. Moreover, I explore how these findings might shed light on the different policy pathways of BC, Ontario, and Québec.

In British Columbia, I found that from 2008 to 2018, the government promoted GHG reduction as an imperative for PEV policy but the importance of "clean energy" goals and the presence of automobile associations may have also been influential in the framing of PEV policy in the province. First, I found that the *Incentives for climate* storyline put forth by the government is somewhat similar to the "clean energy" policy storyline (2007 onwards), which promoted climate change mitigation as a rationale for clean energy projects (Dusyk, 2016). For instance, I found that the BC government labeled PEVs as "clean energy vehicles" (see Statement 2). Thus, the importance of the energy industry in BC (mostly hydroelectricity) might have been influential in positioning PEV policy

alongside other energy and climate goals aiming towards "BC's clean energy future" (Statement 6). Second, the *Carrot, not stick* storyline put forth by the New Car Dealers Association suggests that the automobile industry in BC was influential in promoting demand-focused policies (carrot) over supply-focused policies (stick). Aside from experts and some NGOs that supported a ZEV mandate, the BC PEV policy discourse found in this study mostly promoted demand-focused policies. Consequently, these findings suggest that the BC PEV policy discourse is characterized by the "clean energy" goals of the province along with the influence of the automobile industry in promoting demand-focused policies. In addition, I speculate that the government's silence over policies that target the industry such as the ZEV mandate and the LCFS might be partially explained by its desire to not open public debate (in the media) over these types of policies.

The case of Ontario suggests that the opposition between two political parties (Liberal and Progressive Conservative) over energy and climate policies along with the importance of the automobile industry shaped the storylines found in the PEV policy discourse. Specifically, the *Green economy* storyline (put forth by the Liberal government, from 2008 to early 2018) framed PEV policy around green jobs and economic benefits to the automobile industry. This "economic development" rationale was also highlighted by a study that explored energy policy discourse in Ontario and found that the government discourse between 2009 and 2018 emphasized clean energy, climate change mitigation, and green economy (Mang-Benza et al., 2020). However, as described in Section 1.4, the Liberal political agenda aroused critiques in the province given that electricity prices increased by about 15% between 2014 and 2018 (Lachapelle et al., 2019; Mang-Benza et al., 2020). For instance, Mang-Benza et al. (2020) found that the government discourse (put forth by the PC party in 2018-2919) claimed to address climate change while fighting "skyrocketing energy costs" and "the job-killing carbon tax". Moreover, the PC party framed climate policies such as the 2009 *Green Energy and Economy Act* (i.e. energy reform) and the 2016 *Climate Change Act* (proposing the cap-and-trade) as responsible for the rise in electricity costs (Lachapelle et al., 2019; Mang-Benza et al., 2020). Similarly, I found that PEV policies in the *Policies for the rich* storyline were also labeled as carrying negative economic impacts to consumers and society. For instance, the PC party labeled PEV policies as "rebates for millionaires", "cash grabs", and "big government programs" (illustrated also in Statements 14 and 15) that hurt small businesses and families.

In short, the *Policies for the rich* storyline put forth by the PC party emphasizes the negative economic impacts of climate and PEV policies and counteracts the economic benefits promoted by the Liberal party in the *Green economy* storyline. These two storylines reflect the political opposition over climate and PEV policies in Ontario, a finding outlined by another study (Mang-Benza & Hunsberger, 2020). Thus, these findings suggest that the 2018 cancelation of PEV policies (financial incentives and cap-and-trade) by the PC party might be an impact of the political adversity between the two political parties and the economic concerns over energy prices. In addition, my study suggests that the demand-focused policy approach adopted in Ontario and how it was framed under the Liberal party might have been influenced by the economic importance of the automobile industry in that region. Moreover, because no ZEV mandate was implemented in the province, the automobile industry did not have to promote publicly (in newspapers) its opinion on the issue, leaving Ontario with a PEV policy discourse centered on demand-focused policies.

In Québec, I found that the history of cultural and political independence influenced the PEV policy discourse and especially the *Forcing PEVs for economic independence* storyline. In this storyline, I found that PEVs were not only framed as a technology offering environmental benefits but also as a tool to accelerate Québec's journey towards economic independence and a low-carbon economy, which is also found in one other study (Haley, 2015). Moreover, these results support the findings of others that highlighted the value of "independence" from fossil fuel in Québec's energy policy (Bernard, 2013). Additionally, this links to the province's traditional agenda of using its clean energy as a catalyst to develop other industries such as pulp and paper, and aluminum (Carpentier, 2006; Dales, 1957; Haley, 2015; Niosi, J., Faucher, 1987). For instance, when announcing the ZEV mandate, the government stated that "*The electrification of transportation is also a way of favoring Québec's electricity over foreign oil. This is economic nationalism!*" (Statement 20). Therefore, findings from the *Forcing PEVs for economic independence* storyline support previous research suggesting that the electrification of transportation is Québec is linked to the cultural understanding calling for economic and energy independence as well as a liberation of oil importation (Bernard, 2013; Haley, 2015).

Additionally, I found that the *Forcing PEVs for economic independence* storyline focused on a ZEV mandate to target the automobile industry and "force" it to offer

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sufficient supply to consumers, a finding unique to Québec and not highlighted in previous studies. Considering the economic ambitions behind Québec's energy independence, this way of framing policy reflects the province's motivations behind a transition to PEV technology. In other words, because Québec aims to accelerate its independence from fossil fuel energy, promoting a ZEV mandate (over demand-focused policies) might be perceived as the only efficient way to publicly claim and reinforce its economic independence from fossil fuel industries. Thus, by targeting the automobile industry (through a ZEV mandate and publicly in the media), the government takes a step further in institutionalizing its desire to support its hydroelectricity industry and move away from oil imports and consumption.

## 5.3. Storylines from the automobile industry

In this study, I found that actors other than government can also play a role in the formation of PEV policy discourse, a finding that echoes with previous research on the framing of energy technology (Peters et al., 2018; Stephens et al., 2008). While advocacy groups and experts did not specifically impact the PEV policy discourses in the case studies (except for the *Regulations for climate* storyline put forth by experts in BC), actors from the automobile industry provided unique storylines of PEV policy. This dominance of voice from the automobile industry in the formation of storylines might also be explained by the role newspapers play in amplifying actors (i.e., sources) over others, which was not investigated in this study. Specifically, I found that the automobile industry in BC and Québec share similar interests relative to PEV policies, and especially towards a ZEV mandate. Similar to findings from other studies that found that the automobile industry opposed the Californian ZEV program (Brown, 2001; Fogelberg, 2000; Wesseling et al., 2014), actors from the automobile industry in BC and Québec provide opposition in newspapers to a ZEV mandate in the decade 2008-2018. However, the automobile industry in Ontario did not provide similar opposition to supply-focused policies. Next, I discuss the similarities found in the *Carrot, not stick* (in British Columbia) and the *ZEV mandate distorts the market* (in Québec) storylines, both promoted by actors from the automobile industry.

In BC and Québec, the storylines put forth by the automobile industry favored a demand-focused over a supply-focused approach to policy. At first, the results from the content media analysis in BC show that the automobile industry mostly stated positive

mentions of demand-focused policies, with some negative mentions of supply-focused policies. However, the discourse analysis (which included the analysis of statements in addition to opinion articles) revealed that the New Car Dealers Association, which represents more than 390 automobile dealers in BC, firmly promoted a "carrot, not stick" policy approach framing the ZEV mandate as economically harmful to the automobile industry. Similarly, the *ZEV mandate distorts the market* storyline suggests that the automobile industry in Québec was not supporting the implementation of a ZEV mandate for similar economic reasons. For instance, the automobile industry in Québec said, "*no to a ZEV mandate, but yes to generous financial incentives* [...]" given that "*a ZEV mandate would have negative impacts on dealerships* [...] (which) *could be very expensive*" (Statement 26). Therefore, between 2008 and 2018, actors from the automobile industry in BC and Québec opposed the implementation of a ZEV mandate but supported demand-focused policies in newspaper coverage.

These two storylines echo a discourse from opponents of the Californian ZEV mandate arguing it would "constitute a drag on the California economy" (Brown, 2001). Additionally, the *Carrot, not stick* storyline suggests that the NCDA acted as the dominant voice for the BC automobile industry in its opposition to a ZEV mandate. In other words, the results from the content analysis (Figure 8) show that actors from the automobile industry in BC (including manufacturers, dealerships, and industry analysts) did not specifically oppose a ZEV mandate (3% positive mentions, 3% negative, and 3% neutral). However, in opinion articles from the NCDA, the association clearly stated that it did not support the policy. This finding aligns with the work of Wesseling et al. (2014) that found that US automobile associations were utilized by the industry (manufacturers) to advocate their policy interests. However, this finding was not captured in Québec newspaper coverage. Nonetheless, these two storylines highlight the importance of the automobile industry in the formation of PEV policy discourse of a region and the opposition of a ZEV mandate.

In contrast, this study suggests that actors from the automobile industry in Ontario did not specifically support or oppose a particular policy approach, at least in newspaper coverage. In Figure 4, results show that this actor category has fewer statements in Ontario (N=60) than in BC (N=94) and Québec (N=84), which was unexpected given the importance of this industry in that region. In addition, as shown from the content analysis (Figure 12), the automobile industry mentioned a mix of positive and negative

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statements of PEV policies. For instance, some actors from the automobile industry category supported financial incentives while others called it a "*foolish policy*" (Statement 17). Moreover, the automobile industry in Ontario did not particularly oppose supply-focused policies. Arguably, given its economic importance in the province, the automobile industry expressed similar policy interests as it did in BC and Québec (supportive of demand-focused policies). Although, I did not find specific evidence of this support in my study. Further, because a ZEV mandate was not on the political agenda in Ontario, the automobile industry did not have to publicly oppose supply-focused policies.

While I recognize the influence of other actors (automobile industry) in the formation of policy discourse, I also acknowledge the exploratory nature of this study as well as the extent to which actors (and storylines) can successfully influence policy decision making. Nonetheless, this study and its findings make the same argument as other studies (Howlett, M., Ramesh, M., & Perl, 2009; Victor Valentine et al., 2017), that policymaking (and policy research) of transportation, climate, or energy policy, should not underestimate the impact that power, special interests, and discourse have on agenda-setting, policy design, and policy implementation.

## 5.4. Limitations and future research

In this section, I explain the limitations of this study relating to the design, methods, and results, and suggest possible directions for future research.

One limitation lies in the process behind the selection of newspapers. I chose newspapers based on their circulation in each province (see Table 3) thus rejecting smaller or independent newspapers that might promote different perspectives of policy issues. In Canada, research has shown that the concentration of media ownership impacts the quality of news coverage as the range of voices included in political news coverage is narrowed (Blidook, 2009). Thus, the fact that 33% of the newspaper articles retrieved in British Columbia were written by the NCDA suggests that The Vancouver Sun and The Province may prioritize the voice of the automobile industry over others. Hence, I acknowledge that the results in BC are limited to this characteristic of newspaper coverage. As mentioned earlier, I did not quantitatively analyze opinion articles and articles written by a representative but if coded, the dominance (i.e., number of statements) of the automobile industry in BC might have been greater than what the

results of this study suggest. Therefore, future research using newspapers as a tool to investigate discourse may wish to select a mix of newspapers or a mix of various media (e.g., newspaper and social media) that have a diversity of media ownership to limit the influence of external interests.

I also acknowledge some limitations relating to the choice of search terms I used during the selection of newspaper articles. For instance, while I searched for "rebate", "standard", "mandate", "regulation", or "policy", I did not specifically search for "ZEV mandate" (or ZEV standard), "vehicle emission standard", nor for "LCFS" (or Low Carbon Fuel Standard). Thus, some policies might have been mentioned in other articles, and not in the context of PEVs.

Another limitation relates to the mediated character of the statements analyzed in this study. As mentioned in Chapters 1 and 2, I chose to use newspaper coverage as a tool to illustrate the social perspective of policy discourse, reflect the interplay between the different storylines promoted by actors (discourse coalitions) in the three case studies and situate these storylines in context (over the decade 2008-2018). However, the statements retrieved were selected and positioned by the media prior to my analysis. Therefore, while I did not explore the role and practices of media in the influence of policy discourse, I acknowledge that the statements analyzed in this study have been subject to media practices and norms. In other words, some statements or elements of discourse might have been purposely omitted, emphasized, or changed by the media. Nevertheless, using statements retrieved from newspapers provided a social perspective of the discourse around policy that is communicated to the public, rather than an internal and "behind closed door" discourse retrieved from documents produced by actors themselves (e.g., documents, reports, news releases, etc.).

Another limitation prevails in the mixed-method approach I used to achieve my research objectives. A mixed-method approach can be critiqued regarding the incompatibility of quantitative and qualitative methods used in one study given their divergent methodological approaches (Doyle, Brady, & Byrne, 2009). However, a rigorous mixed-method approach will use and mix appropriate methods to answer the stated research objectives, which I aimed to do in this study. By adding a discourse analysis to the content analysis, I aimed to address the limitations of quantitative analysis such as a lack of depth and meaning. Moreover, I used a mixed-method

approach in my study to utilize the strengths of content analysis by identifying patterns in the text, which guided my structure of qualitative analysis.

Additionally, a common critique of the use of mixed-methods relies on the researcher's expertise with quantitative and qualitative methods (Doyle, Brady, & Byrne, 2009). To address these limitations, I attempted to exercise rigor throughout the analysis by clearly and carefully explaining the method and data used, providing illustrative statements that confirm my findings, and being transparent relative to the strengths and weaknesses of my methods.

I also acknowledge that content and discourse media analysis are distinct evidence-based research methods that have their limitations. First, content media analysis is limited to an objective examination, which often lacks in-depth analysis (Sovacool, Axsen, et al., 2018). However, given that the coding process was guided by a conceptual framework based on theory and interpretation as explained in Chapter 1, the content media analysis performed in this study has also a subjective nature (in contrast with content analysis conducted by more than one researcher and validated through intercoder reliability). Therefore, the frequencies of frames presented in Chapter 3 must not be used to infer causality and must be interpreted with prudence, especially that some actor categories (especially government) have a low number of mentions. Second, discourse analysis remains subject to the analyst's interpretation and the results from such method are generally less precise, speculative, and not for generalization. Further, the discourse analysis conducted in this study draws from my approach (and interpretation) of discourse analysis, as explained in Chapter 2. Hence, the PEV policy discourses identified in this study provide some insights into PEV policy implementation but further inquiries are needed to validate my findings and better answer my research questions.

I acknowledge that there is uncertainty related to the results from both methods as they are subjective to my interpretation and should not be generalized or used for causal explanation. As mentioned earlier, intercoder reliability was not conducted in the content analysis given that I was the only coder. Thus, the analysis was not calibrated with another party and remain subject to my interpretation. In the discourse analysis, the resulting storylines are the outcome of my interpretation given that this method relies on subjectivity and interpretation (thus my personal biases, experiences, values, and

perspectives). To minimize the limitations associated with interpretation and personal biases, further research might want to adopt a "methodological triangulation" to compare, evaluate, and test results (Sovacool, Axsen, et al., 2018). The strength of this approach relies on its use of multiple methods of data collection to present a social phenomenon from multiple angles (Denzin, 2017). When applied effectively, methodological triangulation can lead to more advanced answers to research questions (Flick, 2018). In other words, triangulation adds depth to data and helps mitigate bias associated with qualitative research methods because it considers multiple perspectives (Fusch et al., 2018). For instance, to validate the results outlined in this study, I could have interviewed key actors such as government officials or conducted a document analysis of a selection of communication documents. However, these additional analyses were not within the scope of this study.

I also recognize that other elements of discourse might have been advanced during the study period (2008-2018) although not captured by my analysis. A complete discourse analysis would have focused on document analysis (e.g., government documents, public hearings, press releases, etc.), not only newspaper (and statement) analysis. In addition, given that I did not analyze statements from actor categories that had a very low number of mentions (e.g., electric utilities), a document analysis would provide additional and better understanding of the storylines promoted by actors that had less voice in the newspaper coverage. Again, future research that explores policy discourse may want to consider applying a multi-method approach by conducting interviews with stakeholders and/or a careful analysis of documents to get various evidence-based insights.

Finally, the research design and the results of this study remain exploratory given that it investigated policy discourses to shed light on policy implementation. In this study, I identified three PEV policy discourses and the storylines that characterize these discourses, but these findings attempt to explore rather than explain the different storylines (and reasons) behind PEV policy implementation in the three case studies. In other words, other relevant elements of discourse (or policy explanations) might not have been captured by this study. Therefore, the results of this study should be seen as tentative rather than conclusive, and a basis for further inquiry.

Given that this study aims to shed light on policy implementation and contribute to the discussion of transportation policy, future research should investigate the relationship between policy discourse and public acceptance and support of technology and policy. Previous research has looked into how the framing of low-carbon innovation can impact socio-political acceptance of these innovations (Peters et al., 2018), but how policy discourse influences or changes the public's perceptions and acceptance of PEVs and PEV policy has received less attention. Insights from such research could help further understand the role of framing and discourse in the successful adoption and implementation of low-carbon innovation policies. In addition, more research on the social aspect of policy is needed to complement the extensive research work focusing on technical and economic components of policy decision-making.

# Chapter 6.

# Conclusion

In this study, I explored the role of framing and storylines in the formation of policy discourses and how these discourses can provide insights into PEV policy implementation in a region. Specifically, I explored the case of three Canadian provinces (British Columbia, Ontario, and Québec) to shed light on why governments adopted different policy approaches, at different times. I applied a mixed-method analysis of mediated statements from government and other actors with interest in PEV technology. First using content (quantitative) media analysis, I analyzed frequencies of frames related to PEV technology and policies. Second, using discourse (qualitative) analysis, I analyzed how frames unite into storylines that are promoted by governments and other actors. The results from the content analysis guided the discourse analysis from which I aimed to identify and compare storylines in the PEV policy discourse of each region. In the three case studies, I found that while governments mostly framed PEVs as a good offering many environmental and economic benefits, governments emphasized private consumer values when framing policy. I also found that regional socio-political factors and especially economic factors impacted how governments and other actors framed PEV policy in their storylines. Additionally, I found that actors from the automobile industry tend to publicly oppose regulations such as a ZEV mandate arguing these would have a negative economic impact on their industry.

While exploratory, the findings from this study can help shed light on the PEV policy pathways of the three case studies. In British Columbia, I found that clean energy goals and economic influences from the automobile sector influenced the PEV policy discourse in BC (from newspaper coverage), which emphasized demand-focused policies. Specifically, I found that the government remained conspicuously silent in newspapers over a ZEV mandate while the automobile industry had a dominant voice in newspapers and firmly opposed the implementation of such policy. In Ontario, I found that the PEV policy discourse was divided between two discourse coalitions put forth by opposing political parties that provided divergent positions regarding PEV policies. Given that most of the policies implemented in that province between 2008 and 2018 were demand-focused policies, the government and other actors centered their storylines

around these types of policies, without significant opposition (in newspapers) to supply-focused policies. Finally, in Québec, I found that the province's ambition towards fossil fuel independence influenced the PEV policy discourse and its focus on a ZEV mandate, which was implemented in 2018. Similar to the case in BC, the automobile industry in Québec provided opposition to the implementation of a ZEV mandate. In contrast to the other provinces, Québec promoted PEV policies in newspaper coverage to force the automobile industry to offer more PEVs, while pursuing its goal of economic and energy independence.

While this study may not result in direct and explicit policy recommendations, its findings can help explore hypotheses as to why PEV policies in these regions were implemented during the decade 2008-2018. Future research is needed to further explore the findings of this study and better explore PEV policy implementation. However, the recognition of the role of policy discourse in policy implementation highlights how effective policy changes do not rely exclusively on technical and economical processes, but political (and social) ones as well (Scrase et al., 2010). Moreover, the results of this study can shed light into how governments might influence low-carbon technology legitimacy and development through discourse. Similar to Brown (2001), I argue that governments play a special role in the framing of technology, and policies that aim to support technology should be promoted in a way that enhance legitimacy and acceptance of these technologies. Finally, this study highlights the value of discourse in policy research and how it may shape how we socially understand concepts such as technology and policy.

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# Appendix. Full Coding Guide

| Variable | Description | Code | Examples |
|---|---|---|---|
| **Part A: Article information** | | | |
| Article number | Same as the PDF file. | | VSun_01_14 |
| Date | The date of the publication of the article (MM/DD/YYYY). | | 08/14/1993 |
| Source | The source (newspaper) of the article. | 1= The Province<br>2= Vancouver Sun<br>3= Toronto Star<br>4= Toronto Sun<br>5= La Presse<br>6= Le Devoir | |
| Author | The name of the author. | Text. | |
| Headline | The article's headline. | Text. | |
| Section | The newspaper's section where the article has been published | 0= Not mentioned<br>1= General news (includes special section)<br>2= Cars<br>3= Business<br>4= Technology<br>5= Opinions/debates<br>6= Environment<br>7= Economy<br>8= Politics<br>9= Others (e.g., Homes) | |
| Item type | The way that the story is written. | 1= News report: descriptive<br>2= Editorial: integrates comments and evaluation of an issue<br>3= Opinion: a story that offers a first-person opinion or is a stated | |

| | | opinion of the newspaper<br>4= Article by a representative, letter, special collaboration or column, interview<br>5= List | |
|---|---|---|---|
| Representative | If the article has been coded "4" in the last variable (meaning it is written by a representative), it has to be coded according to the source type variable. | See actor category variable below. | |
| Main | The main subject of the story (as defined by the headline and first few sentences). | 1= PEV policy<br>2= Climate & environmental policy<br>3= Political campaign or action (includes political parties' policy plan)<br>4= A jurisdiction's PEV policy development (other than BC, ONT, QC)<br>5= PEVs as a technology<br>6= Environmental concerns<br>7= Cars/auto industry<br>8= Others | 1=If the article is strictly about a specific policy (e.g. a ZEV Mandate)<br>2= If the article is mainly about a broader climate policy (e.g., The CleanBC plan) but mentions a PEV policy. |
| About | A brief textual description of what the article is about. | Text. | . |
| Focus | If the article focuses on PEVs as a technology, PEV policy or both. | 1= PEVs as a technology<br>2= PEV policy<br>3= Both | |
| **Part B: PEVs frames** | | | |

| | | | |
|---|---|---|---|
| In this section, we are looking only at how PEVs (as a good, a technology, a mode of transportation, and a product) are represented in the article according to the PEV private-societal framework. **This section is NOT about POLICY, only about PEVs.** | | | |
| Actor category | This variable code whether a specific source is used in the article or not **when referring to PEVs, not A POLICY**<br><br>Sources will be *stating* things. A source is included when directly cited or paraphrased. Indirect references and hypothetical references (e.g., Justin Trudeau would say) are not included. | 1. Government<br>2. Automobile industry<br>3. Advocacy groups<br>4. Experts<br>5. Opposing political parties<br><br>*These actor categories are to be coded according to the PEV private-societal framework (next variable). | |
| PEV frames | Each actor category is coded for their statements towards PEVs according to the PEV private-societal framework.<br><br>Under the actor category, this value will be added. | 0= No attribute<br>1= Private positive financial<br>2= Private positive performance<br>3= Private positive convenience<br>4= Private positive identity<br>5= Private positive others<br>6= Private negative financial<br>7= Private negative performance<br>8= Private negative convenience<br>9= Private negative identity<br>10= Private negative others<br>11= Public positive environment<br>12= Public positive economic development<br>13= Public positive innovation<br>14= Public positive others | "*The first was to reduce the environmental impact by driving cleaner vehicles producing less emissions. Secondly, we wanted to save money on gas, but thirdly, we wanted to support the technology.*"<br>**In this statement, I would code the following values: 11, 1, and 5.** |

| | | 15= Public negative environment<br>16= Public negative economic development<br>17= Public negative innovation<br>18= Public negative others | |
|---|---|---|---|
| **Part C: PEV policy frames**<br>In this section, we are looking only at how **PEV policy** (as a unique policy or part of a broader climate plan) is represented/discussed in the article. | | | |
| Actor category | This variable account for the statement(s) present in the article regarding a specific policy. | 1. Government<br>2. Automobile industry<br>3. Advocacy groups<br>4. Experts<br>5. Opposing political parties<br><br>Each source is to be coded as:<br>0= Not present<br>1= **+(number)**: for support of a policy<br>2= **-(number)** for opposition of a policy<br>3= **(number)N** for Neutral/mixed<br><br>*"Number" is referring to the code of the different PEV policies listed in the next row. | If a researcher states: "*a ZEV Mandate is an efficient policy*", it will be coded **+26** (positive) under the cell 4. |
| PEV policies | List of the PEV policies coded. | 20. Financial incentives<br>21. Charging infrastructure<br>22. Outreach campaign<br>23. Carbon pricing<br>24. Non-financial incentives<br>25. Others<br>26. ZEV mandate<br>27. Vehicle emission standard<br>28. Clean fuel regulation | |