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Framing nuclear energy

The nuclear energy discourse in House of Representatives party manifestos
 through a lens of sustainability

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Abstract

With ever growing populations and rise of consumer societies, the demand for energy has been increasing massively. Conventional energy sources such as coal, oil and gas are limited and are not fulfilling current societal needs. Substitute forms of energy supply are becoming increasingly popular due to the existing threat of greenhouse gas-induced climate change, health impacts and energy-security issues. While being a controversial alternative, nuclear energy has been given increased attention. In order to investigate in which ways nuclear energy is being brought to the public's attention, the current study assesses how nuclear energy is framed in political party manifestos. A total of 186 party manifestos that have been used by elected parties between 1967 and 2021 have been examined using a content analysis. General attitudes have been investigated and arguments supporting or opposing nuclear energy have been categorized. A consistent increase of the discussion of nuclear energy in party manifestos was not found, and it becomes clear that the Dutch government does not hold a consistent negative or positive attitude towards nuclear energy. However, a pattern in the use of four identified frames can be found. The civil society frame is most frequently used, while the economic, environmental and scientific/political frames are used significantly less. On the other hand, the civil society frame is also the frame with the least diversity in arguments.

Key words: House of Representatives; Nuclear energy; Climate change; Elections; Content analysis

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List of Abbreviations and Acronyms

AOV	Algemeen Ouderen Verbond
ARP	Anti-Revolutionaire Partij
BBB	BoerBurgerBeweging
CD	Centrum Democraten
CDA	Christen-Democratisch Appèl
CHU	Christelijk-Historische Unie
CP	Centrum Partij
CPN	Communistische Partij van Nederland
CU	Christen Unie
D66	Democraten 66
DNM	Did Not Mention
DS'70	Democratisch Socialisten '70
EVP	Evangelische Volkspartij
FOM	Fundamenteel Onderzoek der Materie
FVD	Forum voor Democratie
GL	GroenLinks

GPV	Gereformeerd Politiek Verbond
JA21	Juiste Antwoord 21
KPV	Katholieke Volkspartij
LPF	Lijst Pim Fortuyn
NE	Not Elected
NEG	Negative
NEU	Neutral
NMP	Nederlandse Middenstands Partij
POS	Positive
PPR	Politieke Partij Radikalen
PSP	Pacifistisch Socialistische Partij
PVDA	Partij van de Arbeid
PVDD	Partij van de Dieren
PVV	Partij voor de Vrijheid
RCN	Reactor Centrum Nederland
RKPN	Rooms-Katholieke Partij Nederland
RPF	Reformatrische Politieke Federatie

SGP	Staatkundig-Gereformeerde Partij
SP	Socialistische Partij
VVD	Volkspartij voor Vrijheid en Democratie

1. Introduction

1.1 Background

Since the impending world energy crisis due to limited oil supplies in the early 1970's, many research projects have been performed on alternative sources of energy production. With ever growing populations and rise of consumer societies, the demand for energy has been increasing massively (Previdi, Smith & Polvani, 2021). The production of this energy is often related to limited resources such as coal, oil and gas, and has large impacts on biodiversity and natural areas. Therefore, the focus is slowly shifting to alternative renewable energy sources. The need for substitute forms of energy supply comes from the existing threat of greenhouse gas-induced climate change, health impacts and energy-security issues (Hansen et al., 2013). Examples of non-fossil fuel energy sources are hydro-electric dams, nuclear, wind, biomass and solar power (IEA, 2013). While the realization is setting in that frequently used energy sources are not unlimited, the demand for energy is still growing, especially in the developing world (Clarke, 2007). In order to limit the effects of the ever rising demand for electricity, new ways of producing energy should be adapted. According to Brook & Bradshaw (2014), these new forms of energy production should commit to a number of criteria. First, the best energy option uses the least amount of land and fresh water in its production or mining process. Secondly, it should minimize pollution such as carbon dioxide, aerosols, heavy metals and toxic chemicals. Furthermore, this energy source should restrict habitat fragmentation and have a low risk of accidents that have great long-lasting impacts, such as oil spills, dam-burst floods and radioactive fall-out. Lastly, also indirect effects are important. Therefore, the energy source must be cost-effective, trustworthy and ready for use.

One of the proposed energy sources is nuclear energy. Today, approximately 10% of the global electricity is generated with nuclear energy. However, controversy about its sustainability still exists. By some it is classified as a low-carbon energy source (Ahearne, 2011; IEA, 2020; Hill, 2008), while others argue that the carbon intensity of nuclear energy is much higher compared to other low-carbon sources (Nian, Chou & Baully, 2014). Some studies even found that nuclear energy does not contribute to the reduction of fossil fuels, improving human well-being and sustainable development (Gralla et al., 2017). Another controversial aspect of nuclear energy is the debate about the storage of nuclear and radioactive waste (Sjöberg, 2009). Furthermore, nuclear energy is often perceived as dangerous as it could potentially cause enormous catastrophes (Wealer et al., 2019). Contrastingly, proponents of nuclear power argue that it is one of the safest options of all energy sources when calculating the total risk per unit energy output (Inhaber, 1977). Overall, the quantity of accidents with nuclear power plants is low and declining (World Nuclear

Association, 2022). Because of the controversy and the need to utilize fewer fossil fuels, political interest in the topic of nuclear energy has been increasing, making it an important topic on the political agenda.

The development of Dutch political interest in nuclear energy emerged in the 1970s when it became 'hot-topic' for the first time. Resulting from the oil crisis in 1973, environmental organizations and criticism of the consumption society emerged. Because of the polluting nature of human activities and existence, nuclear energy became more and more important in societal debates. This was remarkable because the settlement of the first nuclear power plant in the 1960s had not led to significant social resistance (Cramer, 1988). However, from 1973 onwards, inhabitants of the Netherlands started with protests and demonstrations. Among others, these demonstrations took place in Kalkar in 1977 and at the ultracentrifuge factory in Almelo in 1978 (van den Bosch, 2006). This ultracentrifuge factory is owned by Urenco and serves the purpose of enriching uranium which is needed to produce nuclear energy (Urenco, n.d.). Initially, nuclear energy was mainly an extra-parliamentary topic, but it rapidly became of great importance within political debates as well. The most important debates discussed changing the agreements with France and the United Kingdom about the return of radioactive waste to the Netherlands. These agreements included arrangements about fuel elements from nuclear power plants in the Netherlands that would be sent to specialized reprocessing companies to be separated and utilized to its maximum capacity. By doing this, the amount of residual waste could be minimized. The political debates emerged when the French and the United Kingdom's governments changed the requirements of the existing agreements. In order to prevent that these countries would end up with large amounts of nuclear waste, the residuals needed to be sent back to the country of origin (House of Representatives, 1979). Because the Netherlands did not have the capacity to reprocess its nuclear waste itself, and there was not sufficient space to store it, they agreed with these new terms. Additionally, the agreements with France and the United Kingdom were necessary in order for private companies to develop new nuclear power productions. In the following years, movements of activist nature emerged, especially after the nuclear disaster in Chernobyl in 1986.

1.2 Rationale

Because nuclear energy is a controversial topic with broad societal relevance, it has been the subject of many research projects. However, when investigating the combination of nuclear energy and framing, a large share of this research regards the framing of nuclear energy in media such as newspapers. While this is an interesting perspective, insight in political stance points is also required. Not many papers have focused on this political aspect. From the few projects that have been performed, it becomes clear that resistance towards nuclear energy is mostly present in left-wing parties, but many discrepancies between the different research projects exist. By looking at a motion that was proposed in the House of Representatives, the attitudes towards nuclear energy can be more easily identified. In 2018, the majority of the House of Representatives voted for plans to build more nuclear power plants in the Netherlands. VVD proposed the plans, and PVV, CDA and FvD supported it. SGP and SP were neither for nor against nuclear energy but were not particularly satisfied with the proposal either. D66, GroenLinks and PvdA opposed the proposal. This dynamic is expected to have evolved quite drastically during the past decades due to events and shifts in the social acceptability of nuclear energy. While research has been performed on the framing of climate change and (anti-)environmentalism in party manifestos (e.g., Gemenis et al., 2012; Blasio & Sorice, 2013) and the framing of nuclear energy in media such as newspapers (e.g., Djerf-Pierre et al., 2015; Du & Han, 2020; Ersoy & İşeri, 2020), research on the framing of nuclear energy in party manifestos is rather unavailable, especially in the Netherlands.

One of the possible causes for this is that the Netherlands has an extremely low share of nuclear energy in its energy mix relative to other countries. Regardless, it is interesting to investigate in which ways nuclear energy is framed in party manifestos in order to get insight into the policy making attitudes. Political engagement with nuclear energy has been, despite the small numbers of power plants and energy production, intense and of great magnitude. Following international (West-European) examples, the Netherlands started with the 'Atoms for Peace' program by the UN in the 1950's (Koopmans & Duyvendak, 1995). While the country initially aimed to dominate the international nuclear energy market, this goal was quite rapidly discarded when natural gas fields were discovered in the province of Groningen. Soon, other countries such as Germany, France and Sweden outpaced the Netherlands in terms of the development in the field of nuclear power (Koopmans & Duyvendak, 1995). The international discrepancy regarding nuclear power policies results in an interesting case for the analysis of framing strategies in political documents. In this particular case, performed research investigated what the role of nuclear energy has been in party manifestos for the House of Representatives elections throughout the years. It aims to answer the following research question: *How is nuclear energy framed in House of Representatives elections party manifestos from 1967 to 2021?*

This question is answered by assessing existing literature and performing a content analysis on a total of 183 party manifestos for the House of Representatives elections between 1967 and 2021.

In general, the energy transition is understudied in light of the social sciences while the societal perspective is believed to be important to complement the usual perspective of energy studies (Wilhite et al., 2000; Guy & Shove, 2000). These studies often mainly focus on the financial costs associated with certain energy choices (Miller et al., 2015). The energy transition is a political process that has been acknowledged (e.g., Meadowcroft, 2009; Hess, 2014), but the role of nuclear energy as part of the energy transition and the framing of the issue is understudied (Edberg & Tarasova, 2016). It is necessary to understand how political parties frame (nuclear) energy in order to reveal the complexity of the issue from a socio-political perspective. Party manifestos make for a useful case study in this respect as they encompass structural overviews of attitudes towards nuclear energy.

1.3 Aim

This research has been conducted to investigate how nuclear energy has been framed in party manifestos for the House of Representatives elections that took place between 1967 and 2021. The performed study adds to the existing body of literature on the topics political attitudes, framing, and nuclear energy. Moreover, the aim has been to provide a strong foundation for future research in the field. With the mixed methods approach of the performed research, it can serve as an excellent basis for further in-depth qualitative research.

1.4 Objectives

More specifically, this research aims to:

- Identify conceptually how political framing can be understood in relation to nuclear energy by investigating existing literature
- Recognize patterns in the frequency of mentions on words related to nuclear energy over time and investigate how this is caused by rapid and slow onset societal events
- Fill the existing research gap by identifying four framing categories that are used to describe attitudes towards nuclear energy in party manifestos
- Determine and categorize the attitudes and arguments that are used in party manifestos regarding nuclear energy based on positive and negative attitudes, and into the four framing categories

1.5 Utility

By investigating how nuclear energy is framed in party manifesto's the existing research gap on the framing of nuclear energy in political documents is (partly) filled. The presented research aims to provide a basis for future research on the specific topic. More presently, the research gives insight in the development of political attitudes towards nuclear energy and how they are framed in party manifestos. With this knowledge, it becomes possible to unveil patterns in the past, and to speculate about future election documents. By combining the presented research with (future) research on public opinions and framing in the media the significance and effects of framing nuclear energy can be investigated. Additionally, by replicating the research in other countries, international perspectives can be compared. The presented research can benefit the energy sector in the sense that probable scenarios for the future can be predicted, preparing the sector for possible policy changes. Furthermore, by specifying the different frames, for future

documents the general focus can easily be determined. It will be clearer whether the focus of the different parties lies on environmental, economic, scientific/political or civil society aspects.

For stakeholders arguing for extended development of nuclear energy, the research can be beneficial because it helps to determine where the focus should be in order to gain influence in policy making. By doing this efficiently, nuclear energy can gain popularity and can be developed further. This would be beneficial for advocates of nuclear energy.

1.6 Research design

In order to gain insights on relevant existing literature, the current paper first provides a literary background in Chapter 2. This includes an introduction to energy production in the Netherlands, the Overton window and framing theories. After this, the methodological approach is discussed in Chapter 3. Here, considerations regarding a case study as a research method are described, and the study area is highlighted. Furthermore, strengths, weaknesses and ethical considerations are discussed, and a reflection on the positionality of the researcher is provided. In Chapter 4 the results of the performed study are presented. The significance of the role of nuclear energy in party manifestos is examined, after which the paper dives into the attitudes towards nuclear energy political parties present in their manifestos. The arguments that are provided in the manifestos are reflected upon, and based on the earlier-defined framing structures the findings are categorized. Lastly, a conclusion follows in Chapter 5.

2. Literature review

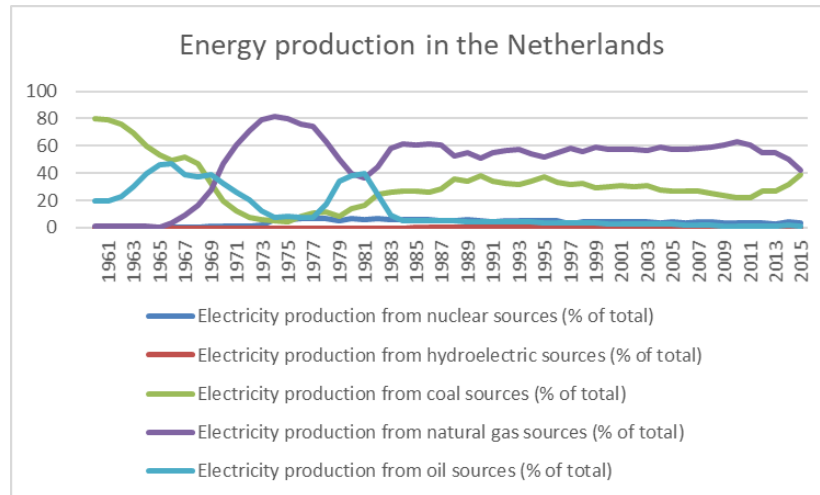
In order to direct the research and to provide a theoretical framework for the analysis of the data, a literature review has been performed. Relevant theories have been incorporated. More specifically, the Overton window and four framing categories have been deducted from existing literature. These have formed the basis for the analysis of the party manifestos. Google Scholar and Smart Cat, the online library catalogue from the University of Groningen, have been used for the literature review. With the help of keywords an initial selection of articles was collected. These keywords included: *House of Representatives; Nuclear energy; Framing; Elections; Content analysis; Climate Change*. By reading the abstracts, the relevance of the selected articles was examined. After this, the snowball sampling technique was adopted where cited articles were investigated. This has led to the presented literature review. With the exception of articles that were perceived as fundamental, the researcher has aimed to select relatively recently published articles. Furthermore, it was aimed to include mostly peer-reviewed papers.

4.1 Electricity production in the Netherlands

The sources of electricity production in the Netherlands have shifted in the past decades. Like other countries in Europe, the Netherlands had been using coal as its main energy source, until they switched to oil sources. In 1959, a natural gas field was discovered in the Northern province of Groningen and due to the oil crisis in the 1970's, the main source of energy in that time was natural gas. In the 1980's coal became more popular again but never won back the position it had before the 1960's. Nuclear energy has never played a big role in the Netherlands, unlike countries such as France and Belgium. In Figure 1, the division of sources of energy production in the Netherlands is visible. It is visible that many shifts have occurred between 1965 and 1983, after which no significant changes can be found. Due to a limitation to gas extraction in Groningen because of earthquake damage, a decrease in the use of gas and an increase in the use of coal can be found since 2010.

Figure 1

The contribution of different energy sources to the energy mix in the Netherlands, 1961-2015 (Data adopted from World Bank, 2020)



4.2 Nuclear energy

The Dutch, and international, aim to shift to sustainable and carbon neutral societies urges global transformations of energy systems. One of the potential mitigation strategies to climate change is nuclear energy. Energy consumption is expected to increase in the following decades, leading to high levels of CO₂-emissions if fossil-fuels remain the main sources of energy (Masson-Delmotte et al., 2018). Nuclear power plants could significantly decrease CO₂-emissions worldwide, but there are crucial risks that need to be taken into account (IAEA, 2018). These risks will be addressed later in this chapter.

The Netherlands aims to reach a set of ambitious goals that were implemented in a national climate agreement to limit greenhouse gas emissions (House of Representatives, 2019). The purpose of this agreement is to encourage compliance with the Paris Agreement (United Nations, 2015). By 2030, CO₂ emissions should have been reduced by 49% compared to 1990, and in 2050, this should even be reduced by 95% (Klimaatakkoord Section B, 2019). The goal for 2020 was to reduce CO₂ emissions by 25% compared to 1990, and this goal has been reached (CBS, 2022). However, when taking a closer look at the data that this is based on, it becomes clear that this number excludes emissions of consumption goods produced in foreign countries. According to recent calculations, the Netherlands emits 38% more compared to the initial calculation (CBS, 2022). While it seems like a reduction of energy consumption is not yet successful, the production of energy from sustainable sources is slightly more prosperous. In 2018, 7.4% of the total energy production was derived from sustainable sources (Vossen, 2020). As mentioned before,

one of the most important aspects in the energy transition in the Netherlands is the long-lasting issue with gas extraction in Groningen. The Dutch government decided that all gas extraction in the province of Groningen must be eliminated, leading to the need for alternative sources (Vossen, 2020).

One of the alternatives for natural gas is energy derived from nuclear power plants. After the second world war, interest in the possibilities of nuclear energy grew and scientific research projects on nuclear fission were stimulated. In 1946, the organization *Fundamenteel Onderzoek der Materie* (Fundamental Research on Matter (FOM)), was founded (Schot et al., 2000). This organization supported universities to perform research on nuclear physics. In Europe, national but interdisciplinary collaborations rapidly concluded that the financial means to build nuclear power plants were not present (Verbong & Lagaaij, 2000). Therefore, the Netherlands sought collaboration with Norway in 1951. This led to dissatisfaction among Dutch energy providers but attempts to national collaborations were unsuccessful (Verbong & Lagaaij, 2000). After these failed endeavors, new impulses into the production of nuclear energy were realized when the FOM published a report in which they stated that the fossil fuel stocks would soon not suffice anymore to provide for the growing energy demand (Verbong & Lagaaij, 2000). Furthermore, nuclear energy was seen as a potential source of economic development, leading to the urge to establish broad and thorough understanding of this modern technology (Aarts & Arentsen, 2017).

The Dutch government desired that independent research into nuclear energy could be performed within the nation, which is why the *Reactor Centrum Nederland* (Reactor Center the Netherlands (RCN)) was founded and a nuclear reactor for the use of research was implemented in Petten in 1955 (Verbong & Lagaaij, 2000). In 1957, the Dutch government declared that the total supply of national energy should be produced with nuclear power by 1975. However, when the natural gas fields in Groningen were discovered, these plans were cancelled because nuclear energy became financially unattractive (Aarts & Arentsen, 2017). From 1965 onwards, rapid developments took place. The first nuclear power plant in Dodewaard was realized in 1968 (Verbong & Lagaaij, 2000), and quickly after, the building of another nuclear power plant near Borssele commenced (Verbong & Lagaaij, 2000). These power plants were the result of efforts by the Dutch government during the oil crisis in the 1970s (Kooij et al., 2018). During this crisis, concerns about energy security played a significant role.

While nuclear energy was viewed as a sustainable source of electricity, activism movements against this matter rapidly increased in popularity after the power plants were established. With the rise of feminism, anarchism and radical environmentalism the traditional discourse of economic and technological development was challenged. The risks of nuclear energy became clearer, and the American scientist John

Gofman reported that the effects of nuclear disasters and radioactive waste were much bigger than previously thought (Semendeferi, 2008). While the government was in favor of increasing the amount of nuclear energy in the following years, support from Dutch inhabitants was missing (Verbong & Lagaaij, 2000; Aarts & Arentsen, 2017). However, after the Chernobyl disaster in 1986, the plans to build more nuclear power plants were doubted. After long consideration, the Dutch government concluded that more nuclear power plants should still be built, but that safety of the reactors should have upmost priority. In 1993, the government ultimately decided that the power plant in Dodewaard would be closed in 1997 (Aarts & Arentsen, 2017). The power plant in Borssele would supposedly also be closed in 2003, but these plans were cancelled a few years after (Aarts & Arentsen, 2017).

Consequently, the Netherlands still has one functional power plant, located in Borssele, which produces 485 Megawatts, approximately 3% of the total energy supply (Rijksoverheid, n.d.). Besides locally produced energy, the Netherlands also imports nuclear power from its neighboring countries Belgium, France and Germany (Rijksoverheid, n.d.). However, both Belgium and Germany have concrete plans to close all nuclear power plants in the coming years. In 2000, the German government voted for the Atomkonsens which should have led to the abandonment of nuclear energy by 2018 (Johnstone & Stirling, 2020). However, in October 2010, the German Chancellor Angela Merkel prolonged the lifetime of existing nuclear power plants until 2036 (Meyer, 2021). After the Fukushima nuclear disaster in 2011, the German parliament approved the Atomic Energy Law amendment, meaning that all nuclear energy would be phased out at accelerating speeds (Kühne & Weber, 2018; Meyer, 2021). Similarly, Belgium decided to phase out nuclear power between 2015 and 2025 after the Fukushima disaster. In 2003, the country produced about 56% of the total electricity demand with its seven nuclear power plants (Kunsch & Friesewinkel, 2014). Therefore, the phase-out of nuclear power is an enormous shift in national energy production.

4.3 Nuclear energy in light of climate mitigation and adaptation

The shift from traditional high-emission energy sources to nuclear energy is viewed by some as a way of mitigating climate change. However, existing debates question the actual level of sustainability of nuclear power. On the one hand it is known that climate change is the effect from carbon dioxide and other greenhouse gases that are released by burning fossil fuels, and as nuclear power generates no carbon emission in its production process it is an appropriate way to mitigate (Kopytko & Perkins, 2011). On the other hand, academics argue that this is a much too simplistic point of view and that it undermines the complexity of the issue. Adaptation of nuclear power plants to climate change is necessary because it

impacts secure and constant activity, as recognized by the International Atomic Energy Agency (IAEA, 2003). Consequently, the IAEA is composing protocols to limit the effect of major hazards to nuclear power plants such as influences from air and sea temperatures, winds, precipitation, flow rates of rivers, and anomalies in sea levels (IAEA, 2003). Besides the mitigation aspect, and the focus on the adaptation of nuclear power plants, some policy makers argue that increased use of nuclear energy would limit the ability of societies to adapt to climate change. Because of the time- and cost intensity of nuclear energy, the focus would shift away from adaptation to climate change. All of the time and financial resources that would be spent on nuclear power, are taken away from possibly more effective adaptation measures (Sortir du Nucléaire, 2015).

The abovementioned perspectives are a selection of various point-of-views regarding nuclear energy. These have aided the performed analysis of the House of Representatives party manifestos.

4.4 Framing

Framing Theory is an important theory in communication studies (Cacciatore, Scheufele & Iyengar, 2015), but has also been adopted by scholars in other disciplines such as political and business studies because of its large applicability (Entman, 1993; Matthes, 2009; D'Angelo, 2002). Originally, framing was understood as a cognitive construct but recently, Krippendorf (2017) argued that framing has a metaphorical meaning and should be understood as acts of communication. Framing as a metaphor means that it represents a picture frame through which the world is presented, it affects what is rendered visible or invisible, articulated or unarticulated. People develop a knowledge of the situation at hand, the moral principles at stake, the potential repercussions and solutions, and those accountable for acting through framing (Entman 1993). Powerful frames have the capacity to amplify the audience's emotions and views.

One of the most important and present debates in framing research is about the use of issue-specific frames instead of generic frames (e.g., Borah, 2011; de Vreese, 2005; Brugman, Burgers & Steen, 2017). Generic framing usually transcends thematic limitations (de Vreese, 2005), examples are the human interest or responsibility frames (e.g., Dirikx & Gelders, 2010; Semetko & Valkenburg, 2000). Issue-specific framing is only applicable to the theme that is being researched (de Vreese, 2005), this included for example Terkildsen and Schnell's (1997) women's movement frame. While generic framing allows for pattern-identification and cross-sectional analyses (Brugman, Burgers & Steen, 2017), issue-specific framing could potentially lead to more in-depth insights within single studies. On the other hand, issue-specific framing complicates the comparability and generalizability of the research results with other studies. Therefore, it is argued that a paradigm shift from issue-specific frames to generic frames is desirable (Borah, 2011).

However, for comprehensive analyses of the effects of framing on the public opinion, it is also necessary to research issue-specific frames. After careful consideration of breadth and depth, taking into account that the timeframe of the collected data is relatively long and the aim is to provide a replicable study for other contexts, it has been decided that the present study will adopt a research method with generic frames.

Two main methodological approaches to identifying frames exist, inductive and deductive (de Vreese, 2005). The inductive approach means that the frames are defined after the analysis of the used material, while the deductive approach identifies frames before the content analysis is performed. In the present research, a deductive approach has been adopted. This means that the frames were identified before the analysis of election programs. However, in order to guarantee that all frames were represented and included, an initial analysis was performed where it was ensured that no frame would be overlooked. This method has been replicated from the study by Djerf-Pierre, Cokley and Kuchel (2015). While this study focused on media framing, its framing categories are useful when applied to the political context. Consequently, the following framing categories have been identified:

- Economic frames (e.g., profit, jobs, costs, ...)
- Environmental frames (e.g., spatial aspects, emission, waste, ...)
- Scientific and Political frames (e.g., innovation, international dependency, democracy, ...)
- Civil society frames (e.g., safety, ethical/moral dilemma, people, ...)

While all frames are generic, they can be specifically applied to the topic of nuclear energy. Economic frames include texts that frame it in light of labor generation, costs and benefits (how much financial costs are related to the project?). For environmental frames, the texts can include topics such as the spatial aspect (how much space of the landscape does it take?), emissions (of CO₂), and (nuclear) waste. Scientific and political frames are combined in one category because an initial analysis of the party manifestos has shown that these are often related and hard to distinguish. They include the need to innovate, becoming internationally independent and guarding democracy. Civil society frames include the perception of safety (is nuclear energy perceived as safe or not?), ethical/moral dilemmas about responsibility for future generations, and people (is the health of employees and local residents affected by powerplants?). The party manifestos from elections between 1967 and 2021 have been analyzed using the 4 aforementioned framing categories.

4.5 The Overton window

The range of policies that is acceptable to the public at a given time is called the Overton window. Policies that fall outside of this window are too radical to be implemented, but the range of the window can shift at any time as its purpose is to represent the public's position (Lehman, 2014). In Figure 2, a visual of the Overton window can be found.

Figure 2

A visual representation of the Overton window (Adapted from Lehman, 2014)



The Overton window is often applied in the field of climate change because climate policies are extremely complex due to ambition and cost (e.g., The Lancet Planetary Health, 2021; Scheuch, 2021). In order to integrate a successful policy, it is crucial to have a clear understanding of policies that would be acceptable for the general public (Scheuch, 2021). An example of a gradual shift in the Overton window can be found in Britain's Labor party's engagement with climate policies. If they had presented extreme policies in 1997 on termination of gas-powered cars sales by 2035 and accommodating a carbon-neutral economy by 2050, they would have received vast resistance. These policies would simply be too far out of the political mainstream. However, by campaigning moderate policies they were able to gradually shift the Overton window until their initial policies fit into it (Scheuch, 2021). Besides gradual changes, the Overton window can also shift suddenly due to external stimulus or events (Lehman, 2014). The elimination of nuclear energy suddenly became much more popular after the Fukushima catastrophe in 2011 (Kang, 2019).

The performed study investigated whether the party manifestos complied with the Overton window at each given time. Sudden events or emergencies such as the Fukushima nuclear disaster (2011) and the Chernobyl disaster (1986) are expected to have caused a shift in party manifestos. The Overton window clearly shifted after the Fukushima catastrophe, as the elimination of nuclear energy suddenly became much more popular (Kang, 2019). It is hypothesized that this effect can also be found in party manifestos of the elections around this time.

3. Methodology

3.1 Case study

The current study includes a descriptive case study of the Dutch House of Representatives elections during the period of 1967 to 2021. The definition of a ‘case study’ that this research follows is: “A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.” (Yin, 2003, p. 13). While nuclear energy is a relevant topic for every country, there are many attitudes towards the implementation of it. With a case study approach, it is possible to investigate a phenomenon within its real-life context, making this a valuable research method (Crowe et al., 2011). As the Netherlands is a country with relatively low shares of energy produced from nuclear resources, it is interesting to investigate how the subject is framed in party manifestos. Furthermore, as mentioned previously, many policy changes have been included in the process of building and phasing out nuclear power plants. Because nuclear energy is a controversial topic, it is interesting to see how discourses have changed over time, whether there are certain patterns to be ultimately discerned, and what can potentially explain these patterns. Some of these questions are answered in the current paper, while others are left to be investigated in future research. The Netherlands has a diverse political landscape, thus, the investigation of attitudes towards nuclear energy is highly fascinating. Another reason for this investigation is that the share of electricity that originates from nuclear energy is extremely low compared to other European countries with nuclear power plants. In general, approximately 26% of the total amount of electricity in Europe is produced with nuclear sources (Ciucci, 2021), while this is only 3% in the Netherlands. Countries such as France (72%), Slovakia (54%) and Belgium (52%) have a much higher share (Nuclear Forum, n.d.).

For the analysis, the period of 1967 to 2021 has been selected because this includes the last election before the realization of the first Dutch nuclear power plant in 1969 in Dodewaard, and stretches to the most recent election. Thus, it provides a complete overview of all elections where nuclear energy could have played a significant role.

3.2.1 Study area

The performed study focused on the parliamentary democracy of the Netherlands as its study area. The Netherlands is a Western-European country with approximately 17 million people, and 25% of its land is situated below sea level (Rot, 2021). This has posed risks to the country in terms of flooding. Therefore, it is important on a national level that the Netherlands addresses the issue of climate change. Furthermore,

globally, the Netherlands has a responsibility to address climate change as it is one of the industrialized countries (Rot, 2021). The research method included a document analysis of House of Representatives party manifestos during the period 1967 - 2021.

The House of Representatives in the Netherlands is one of the two chambers in the bicameral system of the States General. The role of the other chamber is fulfilled by the Senate. At least once every four years Dutch citizens are able to vote, electing people to represent them in national politics. This is a direct vote, which elects 150 members to be part of the upcoming Cabinet term (House of Representatives, 2011). Before these elections, political parties start campaigning. The parties unveil their plans in party manifestos, which are published to inform citizens about the party's plans. Because the elections are inducing the people that will take care of the governing of the country, it is important that these plans are relevant and ambitious regarding the largest issues that play a role in the Dutch society. As one of the biggest challenges in the Netherlands, but also globally, is climate change and sustainability, it is important that these are well-reflected in party manifestos. One of the proposed solutions is nuclear energy, which is why the current paper focuses on this specific representation in party manifestos. The research explores whether sufficient efforts have been made, and how this has taken place.

The case of the Netherlands can provide an overview of the framing of nuclear energy in this specific country, but the findings cannot easily be generalized to other countries due to the complexity and controversiality of the topic. However, the methods that have been deployed in this research can be extrapolated to other contexts. Furthermore, the lenses through which the manifestos have been compared, can be replicated in future studies. This resulted in a study that is not generalizable, but that can be easily replicated. Accordingly, studies could be performed on the similarities or differences in the framing of nuclear energy in party manifestos globally. Party manifestos are commonly used political methods internationally, making it an effective source for comparison. This research serves as an invitation to replicate it in other countries. By not limiting the study to a selected sample in the Netherlands, instead focusing on all parties, the methods used are confidently representative for the Netherlands because all parties with a minimum of one seat in the respective years are included. Overall, case studies are a necessary and sufficient method in social science research (Flyvbjerg, 2006).

3.2.2 The 1967-2021 Dutch elections

Between 1967 and 2021, a total number of 17 elections have taken place. Usually, the elections are to be held once every four years, but in extraordinary circumstances additional elections can be implemented. In Table 1, the outcomes from all elections can be found. Only the parties that have gained a minimum of one

seat in at least one of the elections are included. This figure provides a complete overview of all parties involved in the analysis of the presented research.

Table 1

An overview of acquired seats during Dutch House of Representatives elections, 1967-2021

Year → Party ↓	1967	1971	1972	1977	1981	1982	1986	1989	1994	1998	2002	2003	2006	2010	2012	2017	2021
50Plus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	4	1
AOV	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-
ARP	15	13	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BBB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Bij1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Boerenpartij	7	1	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CD	-	-	-	-	-	-	-	1	3	-	-	-	-	-	-	-	-
CDA	-	-	-	49	48	45	54	54	34	29	43	44	41	21	13	19	15
CHU	12	10	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CP	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
CPN	5	6	7	2	3	3	-	-	-	-	-	-	-	-	-	-	-
CU	-	-	-	-	-	-	-	-	-	-	4	3	6	5	5	5	5
D66	7	11	6	8	17	6	9	12	24	14	7	6	3	10	12	19	24
Denk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3
DS'70	-	8	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-
EVP	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
FVD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	8
GL	-	-	-	-	-	-	-	6	5	11	10	8	7	10	4	14	8
GPV	1	2	2	1	1	1	1	2	2	2	-	-	-	-	-	-	-
JA21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
KPV	42	35	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leefbaar Nederland	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
LPF	-	-	-	-	-	-	-	-	-	-	26	8	-	-	-	-	-
NMP	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PPR	-	2	7	3	3	2	2	-	-	-	-	-	-	-	-	-	-
PSP	4	2	2	1	3	3	1	-	-	-	-	-	-	-	-	-	-
PVDA	37	39	43	53	44	47	52	49	37	45	23	42	33	30	38	9	9
PVDD	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	5	6
PVV	-	-	-	-	-	-	-	-	-	-	-	-	9	24	15	20	17
RKPN	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPF	-	-	-	-	2	2	1	1	3	3	-	-	-	-	-	-	-
SGP	3	3	3	3	3	3	3	3	2	3	2	2	2	2	3	3	3
SP	-	-	-	-	-	-	-	-	2	5	9	9	25	15	15	14	9
Unie55+	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Volt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
VVD	17	16	22	28	26	36	27	22	31	38	24	28	22	31	41	33	34

3.3 The analysis process

This study performed qualitative document analysis in order to investigate the nuclear energy discourse in House of Representatives party manifestos, and has been conducted in light of the interpretivist paradigm. While document analyses can serve multiple purposes, the performed analysis served as a way of tracking change and development as described by Bowen (2009). A relativist ontology has been applied, which means that phenomenon can have multiple interpretations and that there is not one single truth that can be established with measurements (Hammersley, 2013). The research was exploratory, in the sense that theory is generated based on its findings, it can thus be seen as an inductive process.

The content analysis was used as an iterative process that involved skimming, reading and interpretation as suggested by Bowen (2009). The process has been performed on both cross-sectional and longitudinal basis, as it investigated discourse shifts in party manifestos between 1967 and 2021, and examined the different attitudes towards nuclear energy in the various years of election. This has resulted in a broad breadth and depth of the study. Explicit data has been collected from open-source databases, mostly on the websites of the parties. The data included party manifestos for the House of Representatives elections from 1967 until 2021. This resulted in an analysis of a total of 189 documents. However, 3 party manifestos could not be found in archives, this concerns SGP in 1972, CPN in 1977, and CPN in 1972. Therefore, the analysis has ultimately been performed on a total number of 186 document.

The data analysis consisted of a content analysis in the sense of both a conceptual analysis and a proximity analysis supplemented by cognitive mapping. The conceptual analysis examined the frequency of words appearing in the data (Downe-Wamboldt, 1992; Morgan, 1993). Specific words were selected after performing a literature review. These were the Dutch words [kernenergie] (nuclear energy) and [kerncentrale] (nuclear power plant). After the frequency of words had been determined, the proximity analysis investigated patterns in co-occurrence and gave meaning to the words found in the conceptual analysis. The specific sentences or sections that included the predetermined words were copied and pasted into a separate document. In this document, the specific (dis-)advantages each party mentioned in each year were collected. In order to analyze this, the data was coded based on the arguments for or against nuclear energy that were mentioned in the party manifestos. Each political party received a label for each election; a green label if they have a positive attitude towards nuclear energy, a yellow label if they are relatively neutral towards nuclear energy, or a red label if they have a negative attitude towards nuclear energy. Parties that advocate for more nuclear power plants or continuation of the existing power plant(s) were perceived as having a positive attitude and were thus given a green label. Parties that mentioned nuclear energy as a temporary solution, but clearly stated that they had objections to long-term use, were given a yellow

‘neutral’ label. Lastly, parties that clearly stated that the existing power plant(s) should be phased out, were perceived as having a negative attitude towards nuclear energy, and were thus given a red label. This approach has been inspired by Müller & Thurner (2017). In Table 2, an overview of the coding structure can be found.

Table 2

Coding structure for attitudes on nuclear energy in House of Representatives party manifestos

Code	Label	Description	Example
NE	Not Elected	The party did not participate in this year’s elections, or did not acquire the minimum of one seat to be taken into the analysis.	n.a.
DNM	Did Not mention	The party did not provide text and explanation on their position on nuclear energy.	n.a.
NEG	Negative Attitude	This party does not support nuclear energy. New powerplants are unthinkable, and the existing power plant(s) should be phased out.	PvdD 2017: <i>No new nuclear power plants. Existing power plants will be closed as soon as possible.</i>
NEU	Neutral Attitude	This party argues nuclear energy is a temporary solution, but clearly states that there are objections to long-term use. In the future, other resources should replace nuclear energy.	CDA 1989: <i>Nuclear energy as a supplementary alternative for fossil fuels will, taking into account environmental arguments, not be principally rejected.</i>
POS	Positive Attitude	This party supports and wants to commit to nuclear energy. The existing power plants should be granted permission to stay in production, and new power plants are a (desirable) possibility.	PVV 2006: <i>Build new nuclear power plants.</i>

After the proximity analysis had been completed, cognitive mapping was used to assess changes over time. The coded data were used for this, in combination with the data of the conceptual analysis. Schemes and diagrams were used to create visualizations that are easily understandable and interpretable.

3.4 Limitations and strengths

Content analysis is a research method with relatively many advantages and little disadvantages. Most importantly, it is an unobtrusive method leading to few ethical considerations. All the data that was used for analysis was publicly available and did not include any sensitive information such as personal data. Moreover, it was relatively easily obtainable. The party manifestos should function as a reflection and representation of the party's plans for the future, making it an excellent source for broad coverage of topics. Content analysis, when well-executed, is considered to be a relatively precise research method, and especially insightful for identifying trends over time (Krippendorff, 2018). Furthermore, it is generally considered to be a scientifically rigorous analysis as it combines qualitative and quantitative methods (Krippendorff, 2018). The utilization of existing documents results in data selection, instead of data collection, making it more effective and time-efficient (Bowen, 2009). An additional strength of the performed research is that a document analysis, when performed properly, is considered to be a systematic and transparent process, resulting in a high level of replicability. On the other hand, qualitative research in general is often criticized to be too subjective, notwithstanding content analyses. It is a research method that is subject to human-made mistakes and sensitive to interpretation (Elo et al., 2014). However, it is argued that when reliability and validity are properly taken into consideration, this issue is solved.

Another limitation to the performed study is that it focuses solely on party manifestos as a data source. With triangulation, the research could gain additional depth. Due to the limited timeline of the project, the researcher has chosen to intensify the analysis process of the party manifestos and not perform additional surveys, interviews, etc.

Lastly, a limitation of the research is that it is hard to perform a longitudinal and cross-sectional study on political parties because of shifting positions on the political spectrum. In order to perform a reliable left-to-right wing comparison, it is necessary to establish each of the party's precise position during each election year. This was impossible due to time constraints. Future research could further deepen the performed analysis by including such a comparison based on political orientation.

3.5 Ethical considerations

Although the proposed research did not pose great ethical issues, there are some aspects that needed to be taken into consideration during the research process. Most importantly, the research fulfilled all requirements as stated in the Netherlands Code of Conduct for Research Integrity 2018.

One of the advantages of using pre-existing documents for a document analysis is that it raises fewer ethical concerns compared to other qualitative research methods (Merriam & Tisdell, 2016). As the documents that were used in the performed research are public, there were no confidentiality or privacy issues. All documents that were used have been used as promotion material for the elections in the period 1967 - 2021. They were retrieved from online open-source database that collected the documents over the years, e.g., from the parties' websites.

While the collected data were not sensitive and did not need to be anonymized, it has been stored on a drive with Multi-Factor Authentication.

3.6 Positionality

As the researcher's positionality influences how the proposed research is conducted, its outcomes, and its results, it is crucial to be aware of the implications of positionality (Rowe, 2014). The researcher's worldview impacts ontological and epistemological assumptions, while also impacting assumptions about human nature and agency (Gary & Holmes, 2020). Ontology concerns the researcher's view on the nature of social reality and what is knowable about the world, while epistemology includes the researcher's view about the nature of knowledge (Bahari, 2010; Scotland, 2012). Assumptions about human nature and agency include the researcher's perspective on the manner of interaction between humans and their environment, and how they relate to it (Grix, 2018).

The researcher of the performed research is a young postgraduate student from the Netherlands. Because she is familiar with the Dutch context, this simplified the performance of a document analysis. However, as a student with an interdisciplinary but mostly sustainability-focused background, she is aware of the implications of the energy transition. This has impacted her views on nuclear energy. However, the performed research is not aimed to advocate for/against nuclear power. It aims to provide an overview of the perspective of House of Representatives party manifestos. Therefore, neutrality towards the subject is maintained. Furthermore, the mitigation-adaptation debate is a topic close to home. Because the researcher does not live in an area where the (potential) power plants are located, this does not reflect any bias. The researcher is eligible to vote in the yearly House of Representatives elections, but aims to remove any

impact this might have on the analysis of party manifestos. Overall, the researcher is aware of her positionality and its implications on the proposed research.

4. Findings

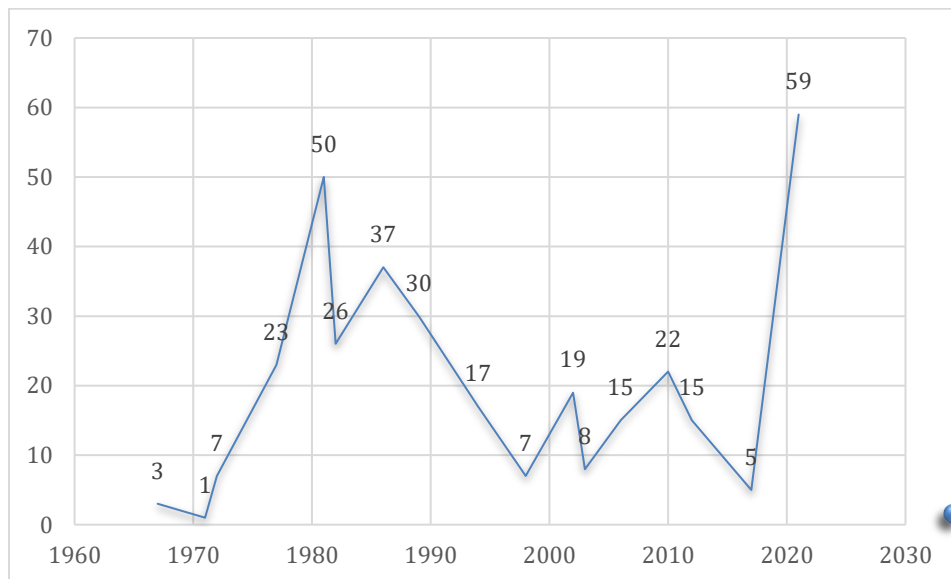
4.1 The significance of the role of nuclear energy

4.1.1 Results

A total of 186 party manifestos that were released during the 1967 to 2021 elections were analyzed. The frequencies of the use of the words 'kernenergie' (nuclear energy) and 'kerncentrale' (nuclear power plant) have been identified per party for every election year. The results of this can be found in Appendix 6.2. Consequently, these results were accumulated, leading to Figure 3. As can be derived from this graph, nuclear energy and power plants were most frequently discussed in 1981 (80 mentions), 1986 (71 mentions) and 2021 (99 mentions). These years have significantly more mentions of the selected words compared to other years. In the following section, the possible causes for this will be discussed.

Figure 3

Frequency of the use of the words 'kernenergie' or 'kerncentrale' in Dutch House of Representatives party manifestos, 1967-2021



4.1.2 Discussion

As mentioned in the previous section, nuclear energy was most frequently discussed in party manifestos for the elections in 1981, 1986 and 2021. In order to understand why nuclear energy played a significant role during these years, potential causes for this have been investigated.

From the 1980s onwards, the controversiality of nuclear energy increased heavily. One of the most important explanations for this was secrecy about reprocessing contracts for the power plant in Dodewaard. The House of Representatives sought to keep the documents about reprocessing contracts confidential, but the government argued that they needed to see the documents before signing them. Partly because of this issue, many Dutch citizens wanted the power plant to be shut down and started protesting. When looking at the Overton window as discussed previously, we can see that the secrecy about the reprocessing contracts shifted the Overton window, and that nuclear energy was no longer acceptable for many people. The two largest protests in 1981 included respectively 15.000 and 40.000 participants, thus it can be concluded that nuclear energy was an important topic during this this. This also provides explanation for the relatively high frequency of the selected words during the elections in 1981.

In 1986, one of the largest nuclear disasters took place in Chernobyl. Because of this, the safety of the Dutch nuclear power plant in Dodewaard was extensively discussed, concluding that it was unsafe because this power plant did not have a second security cover, similarly to the powerplant in Chernobyl. While this has led to the fact that nuclear energy became an important topic during the elections, this was not most likely not the reason for the high frequency of mentions in the party manifestos as the disaster only happened a month before the elections. It is more likely that nuclear energy was frequently mentioned in party manifestos because the government had plans to build new power plants, and the elections would be the final deciding factor (Koördinatiegroep Weiger Atoomstroom, 1986; LAKA, n.d.). All parties wanted to portray their attitudes towards the topic in their manifestos as this would be an important aspect in the election (LAKA, n.d.), leading to a high frequency of the use of ‘kernenergie’ and ‘kerncentrale’.

In 2021, sustainability and climate change were some of the most important societal concerns. Citizens and parties in favor of nuclear energy tend to argue that this could be one of the solutions for the climate crisis because nuclear energy production is not CO2 intensive. On the other hand, citizens and politicians argue that building new power plants takes a lot of time, that we do not have. While the attitudes towards nuclear energy are not synergized, the topic has been getting growing attention. This is reflected in the party manifestos and thus justifies the high frequency of the use of the selected words. The location of the Overton window is not clear in this election year because there is a lot of fragmentation in the political landscape. Public opinions and party manifestos represent a broad range of attitudes and arguments, there is not a clearly identifiable Overton window.

A limitation to this approach is that the results in Figure 3 do not take the amount of elected parties into account. In a year where many different parties are elected the topic of nuclear energy would likely be mentioned more often as more manifestos are included in the analysis. This aspect should be taken into consideration when performing future studies.

4.2 Attitudes towards nuclear energy

4.2.1 Results

After a quantitative analysis of the documents, a qualitative analysis was conducted. The results can be found in Table 3. From this table, we can derive that nuclear energy has gained popularity since 2006. In most of the last 5 elections, there were a number of parties that stated they supported nuclear energy. Especially in 2021, many parties fall into the positive category. While parties seem to shift between positive and neutral, and negative and neutral, there are not many parties that make a sudden shift from positive to negative attitudes or vice versa. CDA is one of the parties that did make a shift from negative in 1977 to neutral or positive in the following years. Furthermore, SGP had a negative attitude in 1981, but switched to neutral or positive in the other years. RPF had a positive attitude in 1981 and 1986, but was against nuclear energy in 1989 to 1998. Lastly, DS'70 switched from a positive attitude in 1972 to a negative attitude in 1977. It is remarkable that, for example, 2012 and 2017 have the same frequencies of the words 'kernenergie' and 'kerncentrale' (Figure 3), while only 61,54% of the parties mentioned nuclear energy in their 2017 manifestos, compared to 100% in 2012. From this, we can conclude that the importance of the topic was unequally distributed over the parties. Some considered it to be extremely important in 2017 and frequently mentioned related words, while other parties did not mention it at all.

Table 3*Attitudes towards nuclear energy in in Dutch House of Representatives party manifestos, 1967-2021*

Party	1967	1971	1972	1977	1981	1982	1986	1989	1994	1998	2002	2003	2006	2010	2012	2017	2021
50Plus	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NEG	NEG	DNM
AOV	NE	NE	NE	NE	NE	NE	NE	NE	NEU	NE	NE	NE	NE	NE	NE	NE	NE
ARP	POS	DNM	DNM	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
BBB	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	POS
Bij1	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	DNM
Boerenpartij	DNM	DNM	DNM	DNM	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
CD	NE	NE	NE	NE	NE	DNM	NE	NEU	NEG	NE	NE	NE	NE	NE	NE	NE	NE
CDA	NE	NE	NE	NEG	NEU	NEU	POS	NEU	NEU	DNM	NEU	NEU	POS	POS	NEU	DNM	POS
CHU	DNM	DNM	DNM	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
CP	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
CPN	DNM	DNM	NA	NA	NEG	NEG	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
CU	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NEG	DNM	NEG	NEG	NEG	NEG	NEU
D66	DNM	DNM	NEG	NEG	NEG	NEG	NEU	NEG	NEG	NEG	NEG	NEG	NEU	NEG	NEG	NEG	NEU
Denk	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	DNM	DNM
DS'70	NE	DNM	POS	NEG	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
EVP	NE	NE	NE	NE	NE	NEG	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
FVD	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	DNM	POS
GL	NE	NE	NE	NE	NE	NE	NE	NEG	NEG	NEG	NE	NEG	NEG	NEG	NEG	NEG	NEG
GPV	DNM	DNM	DNM	POS	NEU	DNM	POS	NEU	DNM	DNM	NE	NE	NE	NE	NE	NE	NE
JA21	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	POS
KPV	POS	DNM	DNM	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Leefbaar Nederland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	DNM	NE	NE	NE	NE	NE	NE
LPF	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	DNM	NEU	NE	NE	NE	NE	NE
NMP	NE	DNM	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
PPR	NE	DNM	NEG	NEG	NEG	NEG	NEG	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
PSP	DNM	DNM	DNM	NEG	NEG	DNM	NEG	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
PVDA	DNM	DNM	NEG	NEG	NEG	NEG	NEG	NEG	NEU	NEG	NEG	NEG	NEG	NEG	NEG	NEG	NEG
PVDD	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NEG	NEG	NEG	NEG	NEG
PVV	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	POS	POS	POS	DNM	POS
RKPN	NE	NE	DNM	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
RPF	NE	NE	NE	NE	POS	NEU	POS	NEG	NEG	NEG	NE	NE	NE	NE	NE	NE	NE
SGP	DNM	DNM	NA	NEU	NEG	NEU	NEU	NEU	NEU	NEU	POS	DNM	POS	POS	NEU	POS	POS
SP	NE	NE	NE	NE	NE	NE	NE	NE	NE	NEG	NEG	NEG	NEG	NEG	NEG	NEG	NEG
Unie55+	NE	NE	NE	NE	NE	NE	NE	NE	DNM	NE	NE	NE	NE	NE	NE	NE	NE
Volt	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	POS
VVD	DNM	DNM	DNM	POS	NEU	NEU	DNM	NEU	DNM	POS	NEU	DNM	POS	POS	POS	DNM	POS

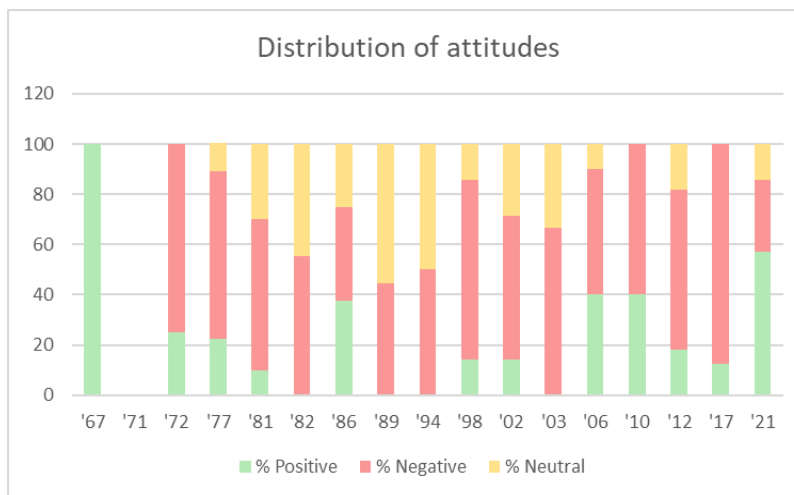
Legend Table 3

NE	Not elected
DNM	Did Not Mention
NEG	Negative
POS	Positive
NEU	Neutral

In order to investigate the general attitude towards nuclear energy in each election year. The data from Table 3 has been quantified and modeled in Figure 4. From this figure, it becomes very clear that 1967 and 2021 are the only two years that the majority of political parties advocate for nuclear energy. In 1989 and 1994 the majority of elected parties have a neutral attitude towards nuclear energy. However, for the other 13 election years, most parties have a negative attitude towards nuclear energy.

Figure 4

Quantification of attitudes towards nuclear energy in Dutch House of Representatives party manifestos, 1967-2021 (excluding DNM and NE)



4.2.2 Discussion

As mentioned in the previous section, the majority of parties hold a negative attitude towards nuclear energy in most years. However, during the first election year, where nuclear energy became a highly relevant topic in the Netherlands due to the newly built nuclear power plant, positive attitudes dominated. Not all risks were yet identified, and optimism prevailed. According to primary sources, during the 1950's, nuclear

energy is introduced as the optimal source of energy and in the following decades, this enthusiasm is sustained (Evrengün et al., n.d.). While oil and coal stocks were declining, and large sources of natural gas were not yet discovered in the Netherlands, fear of international dependency increased. Because international dependency was not desirable according to the Dutch government and society, Minister of Economics Jelle Zijlstra proposed that half of all electricity in 1975 should be of nuclear origin (Evrengün et al., n.d.). Dutch citizens at this time were not afraid of the risks of nuclear energy because they trusted science and scientists with a lot of confidence. Not long before, the country was relatively quickly rebuilt after the Second World War with the help of science. Consequently, science was highly regarded and people did not doubt its reliability (Evrengün et al., n.d.). In the following years, more and more doubts and fears started to settle. In 1972, many political parties oppose nuclear energy. In the early 1970's, the group *Werkgroep Atoom* (later *Werkgroep Kernenergie*) was founded by Jannie Möller, a teacher from Amsterdam (*Kernenergie in Nederland*, n.d.). She read about nuclear energy while visiting Switzerland and started to distribute brochures in the Netherlands. In the following years, more and more people joined her movement (*Kernenergie in Nederland*, n.d.).

It is remarkable that, compared to previous years, many political parties expressed positive attitudes towards nuclear energy in 1986. A month before the House of Representatives elections took place, a massive nuclear disaster in Chernobyl happened. It was expected that this would have led to negative attitudes towards nuclear energy because the immense risks became extra apparent. However, the opposite occurred. While Dutch citizens were already less optimistic about nuclear energy compared to the first years, they became significantly more negative about nuclear energy after the Chernobyl disaster (Dekker et al., 2010). We can thus conclude that the political strategy and attitude in 1986 does not fall within the Overton window. It is likely that the party manifestos for this year's elections were already written before the Chernobyl disaster and that they do therefore not represent the actual attitude towards nuclear energy during the election. In the following election in 1989, the negative attitude is represented and all positive attitudes have disappeared.

More recently in 2021, political parties seem to have regained optimism and positivism in the implementation of nuclear energy. With a slight majority of positive attitudes, the future for nuclear energy looks hopeful. One of the most probable reasons for the sudden shift in attitude is the pressing climate crisis (NOS, 2021). Because the urgency of this crisis is constantly increasing, parties are realizing that taking risks might be the only option to suppress it (NOS, 2021). By 2030, the Netherlands needs to reduce its CO2 emissions from 1990 by 49% according to the *Klimaatwet* (2019b). By 2050 it should even be reduced by 95% (*Klimaatwet*, 2019a). As this law was only introduced in 2019, it was an important topic during the

2021 elections. Many parties stated that if we want to reach the agreements of the Klimaatwet, increasing the share of nuclear energy is strictly necessary. This explains the relatively high number of positive attitudes represented in the 2021 party manifestos.

While nuclear energy was already increasingly mentioned during the 2021 elections, it is expected that this will continue to happen for the next election in 2025. With the Russian-Ukrainian war the international dependency of many countries, including the Netherlands, has become painfully clear. Russia is an enormous supplier of natural gas for many countries, but as bans are put on the import of Russian gas, another substitute is needed. Nuclear energy is currently proposed by some as an alternative, but the question is whether this will suffice. Currently there are many arguments against enlarging the role of nuclear power plants. Most importantly, the Netherlands would still be dependent on Russia as a supplier for uranium (EenVandaag, 2022). This is rather crucial as it again results in international dependency. Furthermore, the process of building more nuclear power plants takes many years, time that is not desirable looking at the ongoing war between Ukraine and Russia. Lastly, it is likely that even with new nuclear power plants, the energy demand in the Netherlands could not be fulfilled, and that natural gas is still needed (RTL Nieuws, 2022). On the other hand, the alternative is to import LNG from the United States, which would again lead to international dependency (RTL Nieuws, 2022). Besides, producing LNG emits more CO₂ emission and is less sustainable compared to natural gas and nuclear energy (EenVandaag, 2022). With an eye on the Klimaatwet, this is important to take into account. To conclude, the discussion about nuclear energy will continue and is even expected to intensify. This will likely be visible in party manifesto analyses for the 2025 House of Representatives elections.

Another interesting insight comes to mind when combining Figure 4 with the 2018 motion as discussed in Chapter 2. The previously mentioned motion included plans to build more nuclear power plants. VVD proposed the plans, and PVV, CDA and FvD supported it. SGP and SP were neither for nor against nuclear energy, but were not particularly satisfied with the proposal either. D66, GroenLinks and PvdA opposed the proposal. In Table 3, we can see that during the 2017 elections, VVD, PVV, CDA and FvD did not discuss nuclear energy in their party manifestos. These are the four parties that vote for it one year later. SGP has a positive attitude in the 2017 party manifesto and votes in favor in 2018. Similarly, D66, GroenLinks and PvdA are consistent in their attitudes. However, SP portrays a negative attitude in their 2017 party manifesto but votes for the construction of more nuclear power plants a year later. In the party manifesto, SP explicitly mentioned that they will not build new power plants and the power plant in Borssele needs to be phased out as soon as possible. They even mentioned that the Netherlands should stimulate and

support Belgium to phase-out its nuclear power plants as well. Future research could investigate what the incentive for this inconsistency has been.

4.3 Arguments for and against nuclear energy

4.3.1 Results

In order to gain more insights on the background of the various parties' positionalities, the arguments that they provide to preserve/eliminate nuclear energy have been analyzed. An overview of the used arguments can be found in Table 4. The frames as identified in Chapter 5.4, have been used to categorize the arguments provided in the party manifestos. It quickly becomes apparent that while there is a great diversity in arguments, many return frequently.

4.3.1.1 The economic frame

The expenses related to building new power plants and operating existing ones, are considered cheap by some and expensive by others. There is no consensus about the real costs of the power plants. Therefore, this financial argument is used both to advocate for and against nuclear energy. In 1977 PSP argued that *"The fairytale that nuclear energy would be cheap has slowly but surely been refuted"*. On the other hand

Related to this, parties often argue that electricity from nuclear sources is cheaper for consumers. The affordability argument is mostly used by right-wing parties advocating for the use of nuclear energy. For instance, VVD argued in 2021 that *"it must stay affordable for regular families and entrepreneurs, and there should always be electricity"*.

Lastly, stability of the electricity network and meeting the energy demand are arguments that clearly fit the economic frame.

4.3.1.2 The environmental frame

Preservation of the landscape is an important environmental argument that is provided in the party manifestos. Parties argue that nuclear power plants do not take up a lot of space. An example of this argumentation can be seen in the 2021 party manifesto from VVD, where they state that nuclear energy prevents that the Dutch landscape needs to be sacrificed for wind turbines and solar panels.

Furthermore, nuclear energy is environmentally framed by arguing that it is a carbon-neutral source of energy. SGP argued in 1986 that nuclear energy was not only the cheapest, but also one of the most sustainable sources of energy available at that time.

Arguments that fit in the environmental frame have also been used to oppose to nuclear energy. For instance, heating of surface water and the dependence on a finite resource are mentioned. Moreover, PvdD argued in 2010 that *“Delving and enriching uranium, the resource for nuclear energy, is extremely polluting”*.

Lastly, some parties argue that nuclear energy is necessary to reach the climate goals, while others argue that developing nuclear energy limits or slows the energy transition.

4.3.1.3 The scientific/political frame

The scientific and political frame is the framing category with the least arguments. However, there are some significant issues that fall within the frame. In the earlier years (until 1982), parties argued that the Netherlands should invest in the development of nuclear power plants in order to stimulate knowledge and experience in the field, which would give the country a strong international position. In 2021, FVD argued that *“NRG in Petten is the only location worldwide where thorium tests can be performed, and a lot of knowledge is present here. This is a leading position that we must never lose”*. This fits with other arguments about international independence that have been provided in earlier years and by other parties. In 2010, PVV mentioned that an important argument to choose for nuclear energy is that *“it makes the Netherlands independent of for example Russia and the Islamic countries”*.

On the other hand, parties argued that nuclear energy is a potential threat for the Dutch democracy. One argument provided by D66 in 1982 was that *“Hard protection of the vulnerable power plants can lead to a slide into a police state”*.

4.3.1.4 The civil society frame

The first argument that fits in the civil society frame is safety. The safety of nuclear power plants is often deliberated. It is interesting to see how safety is used as an argument advocating for, but also against, nuclear energy. In 2021, JA21 put nuclear energy in the civil society frame by arguing that *“nuclear energy is reliable and safe”*, while CU argued in 2017 that there should *“not be any new nuclear power plants, because of safety risks”*.

A second argument fits in the civil society frame and that is often mentioned is residual waste. While parties seem to disagree on the level of safety of power plants, they provide more consistency regarding residual

waste. Before 1994 there have been some parties that had a neutral attitude towards the waste issue, but after this the argument of residual waste has only been used in a negative sense. For example, 50+ argued in 2012 that “*nuclear energy will be abandoned as long as not all risks have been eliminated*”.

Moral responsibility is a topic that generally returns in the civil society frame argumentation against nuclear energy. Because of long term effects, the parties argue that responsibility for future generations should be considered. Besides, moral responsibility for the employees of power plants and local residents should be felt. In 2021, PvdD argued that it is “*morally irresponsible burden future generations with even more nuclear waste that will remain dangerous for thousands of years*”. Furthermore, D66 mentioned in 1981 that “*little is known about the long-term effects of the so-called "lower radiation doses", to which workers in and those living in the vicinity of nuclear power plants are exposed*”.

Table 4

Categorized arguments on nuclear energy used in Dutch House of Representatives party manifestos, 1967-2021

		Economic frame	Environmental frame	Scientific/Political frame	Civil society frame
1967	Pro	Meet energy demand	N.A.	Stimulate knowledge and experience in the field	N.A.
	Against	N.A.	N.A.	N.A.	N.A.
1971	Pro	N.A.	N.A.	N.A.	N.A.
	Against	N.A.	N.A.	N.A.	N.A.
1972	Pro	Meet energy demand	N.A.	N.A.	N.A.
	Against	Not necessary to meet energy demand	N.A.	N.A.	Safety Waste
1977	Pro	Meet energy demand	N.A.	N.A.	N.A.
	Against	Expensive	N.A.	Danger for democracy Military interest	Long term risks and effects Safety Waste
1981	Pro	Meet energy demand	N.A.	Stimulate knowledge and experience in the field	N.A.
	Against	N.A.	Danger for the environment	Danger for democracy	Safety

					Risks for employees Risks for local residents Waste
1982	Pro	Meet energy demand	N.A.	Stimulate knowledge and experience in the field	N.A.
	Against	N.A.	N.A.	Danger for democracy	Risks for employees Risks for local residents Waste
1986	Pro	Meet energy demand Cheap	Little to no CO2 emission	N.A.	N.A.
	Against	Not necessary to meet energy demand	N.A.	Danger for democracy	Waste Safety
1989	Pro	N.A.	N.A.	N.A.	N.A.
	Against	Expensive	N.A.	Irreversibility of the decision	Safety Waste Irreversibility of the decision
1994	Pro	N.A.	N.A.	N.A.	Safety
	Against	N.A.	N.A.	N.A.	Waste Safety Risks for employees Risks for local residents
1998	Pro	N.A.	Mitigation	N.A.	N.A.
	Against	N.A.	N.A.	N.A.	Waste Safety

2002	Pro	N.A.	Necessary for climate goals	N.A.	N.A.
	Against	N.A.	Not sustainable	N.A.	Waste Safety
2003	Pro	N.A.	Necessary for climate goals	N.A.	N.A.
	Against	N.A.	Not sustainable	N.A.	Waste
2006	Pro	Meet energy demand	Little to no CO2 emission	N.A.	Safety
	Against	Expensive	Limited amount of uranium available	N.A.	Safety Waste
2010	Pro	N.A.	N.A.	N.A.	N.A.
	Against	N.A.	N.A.	N.A.	N.A.
2012	Pro	Affordability electricity Stability energy supply Cheap/Affordable High baseload	Little to no CO2 emission More sustainable compared to coal Necessary for climate goals	International independence	Safety
	Against	High start-up costs	Dependent of finite resources Slows/Limits energy transition Mining and enriching uranium is very polluting	N.A.	Safety Waste
2017	Pro	N.A.	N.A.	N.A.	N.A.
	Against	N.A.	Not sustainable	N.A.	Safety Waste
2021	Pro	No adjustments of the energy grid needed Cheap/Affordable Job production Stability of energy supply	Preservation of the landscape Takes up little space Little to no CO2 emission	Could be used for hydrogen production International position	Safety

		Weather independent			
Against	Expensive to produce		Not sustainable	Proliferation issues	Safety
	Takes too long to build		Heating of surface water		Waste
					Morally irresponsible

4.3.2 Discussion

From the results that have been presented in the previous section, we can conclude that there are many frames in which nuclear energy can be framed. It is interesting that nuclear energy was hardly or not politicized at all before the 1977 election. Nuclear energy was seen as a technological development that needed to be stimulated in order to generate knowledge and experience, so that the energy demand could be met, and this would later benefit of the Dutch economy. After 1977, the most important and most frequently mentioned arguments entail safety risks and issues with the storage of nuclear waste. These arguments fit within the civil society frame and are mostly used by parties that oppose the implementation of nuclear power plants but are occasionally also used by supporting parties. Initially, the most frequently used argument by advocating parties fits within the environmental frame as it focuses on the sustainable and carbon-neutral nature of nuclear energy. In later years, opposing parties start using environmental arguments as well. They argue that nuclear energy is not sustainable, especially because of the polluting nature of delving and enriching uranium. When looking at the general nature of the most frequently used arguments, we can see that the civil society frame is most frequently used (N=40). The economic (N=25), environmental (N=21) and scientific/political (N=12) frames are significantly less used.

While the civil society frame is most frequently used, it is also the frame with the least diversity in arguments. Many of the arguments are often re-used, whereas arguments in other frames tend to shift regularly. The origin of arguments that fit within the civil society frame lies in the start of the opposition. In 1986, a turning point was induced by the Werkgroep Atoom. With four main topics being radioactive radiation, safety, proliferation and waste, the countermovement was commenced. It is interesting to see that these four topics continue to be some of the most important arguments used in the nuclear energy debate (Evrengün et al., n.d.). Three of these arguments can be considered to fit in the civil society frame.

In the 2012 and 2021 elections more depth has been brought to the nuclear energy debate by incorporating a larger number of arguments with great diversity in the economic, scientific/political, and environmental

frames. However, the civil society frame is used solely to highlight safety, waste and moral responsibility. Focusing on the negative aspects of nuclear energy, for example by stressing the safety risks, can be seen as an application of ‘politics of fear’. Fear “provides the capacity to both control and manipulate a variety of social and political discourses (Shirlow & Pain, 2003). By creating fear, in this case with the help of party manifestos, political parties can try to control voters and win votes. While arguments such as an increase/decrease of CO₂ emissions might be a similarly significant argument, this generally only concern a relatively small group of voters. On the contrary, safety risks are able to create a feeling of fear within larger groups of people. This is a technique originally most frequently used by far-right wing parties. However, that is not the case in the presented study. All parties indicate safety risks as an important argument, whether it is for or against nuclear energy.

As argued by Birkland (1997), policy making on nuclear energy is influenced strongly by disasters. However, he argues that this influence differs significantly from the way earthquakes, oil spills and hurricanes influence policy making. First of all, the effects of a nuclear disaster are relatively invisible compared to the other mentioned disasters. Secondly, the risk of a nuclear disaster is extremely dread. The level of dead is “so great because the risks involved with the technology are so great and because lay understanding of the technology and its risks is rather limited” (Birkland, 1997, p. 199). The possibility of a disaster is great, and nuclear power has gotten a lot of attention from citizens because of its exoticness, danger, and hard understandability (Birkland, 1997). Because of this, the policy making around nuclear energy is influenced. A third way in which policy making regarding nuclear energy is influenced, is the fact that it was an underdeveloped technology for years. During the early election years, much was still unknown, and opinions were still being formed. This also explains the inconsistency in attitudes. Lastly, policy making in relation to nuclear energy is different from the three other disasters because it is relatively hard to identify accidents when there is no immediate harm (Birkland, 1997). The focus on the safety aspect of nuclear energy can be seen as a social construct that is implemented because of abovementioned reasons. Especially the size of the risk and the invisibility can be seen explanations for the strong focus in party manifestos.

5. Conclusion

The role of nuclear energy in Dutch House of Representatives party manifestos for the 1967 to 2021 elections has differed strongly throughout the years. From the results of the performed study, it can be concluded that the frequency with which the topic has been discussed is inconsistent. Apart from the three discussed years, 1981, 1986 and 2021, the number of mentions of the keywords can be considered as quite low. The three outliers can easily be justified with events that happened and are in line with societal concerns and sudden-onset disasters. In 1981, nuclear energy was important on the political agenda because of secrecy about reprocessing contracts with France and the United Kingdom. Massive protests followed, and the socio-political relevance increased drastically. In 1986, the Chernobyl disaster could be the reason for the high number of mentions of nuclear energy in party manifestos. However, as this sudden-onset disaster happened just one month before the elections took place, it is not likely that this was the case. Most probably, nuclear energy was 'hot-topic' during these elections because the government wanted to build new power plants and these elections would be decisive. In party manifestos for the 2021 elections, nuclear energy is well represented in terms of frequency of mentions. Due to the emerging climate crisis and the fact that sustainability and climate change were some of the most important societal concerns, the topic has grown in popularity. While attitudes towards nuclear energy are not synergized, the topic has been getting growing attention. This is reflected in the party manifestos and thus justifies the high frequency of the use of the selected words.

When delving deeper into the attitudes that parties hold towards nuclear energy, a general negative attitude towards the topic can be identified. In 1967, when nuclear energy was a relatively new topic of relevance for the Netherlands, there was still optimism and hope among citizens and politicians. This is reflected in the party manifestos. During the elections of 1972, the risks of this new energy source were clearer and anti-nuclear organizations were founded. Because of this new awareness, politicians took on more negative attitudes. It is remarkable that relatively positive attitudes were expressed in party manifestos for the 1986 elections. A month before the elections took place, a massive nuclear disaster in Chernobyl occurred. It is likely that the party manifestos were already written before this sudden-onset event, this explains why there is a discrepancy. In the following election, the positive attitudes have been interchanged for neutral or negative attitudes and reflect the response on the Chernobyl disaster. More recently during the 2021 elections, parties seem to have regained optimism as a slight majority of positive attitudes is represented. One of the probable reasons for this is the pressing climate crisis. This trend in positive attitudes is likely to continue for the 2025 elections when looking at the current state of the world. With the Russian-Ukrainian war, international dependency for energy supply has been given increased attention. When a ban is put on

the supply of natural gas from Russia, alternative energy sources are needed. Nuclear energy is one of the proposed alternatives, but is also extremely controversial, which is why it is expected that this topic will be important during the next elections.

The framing of arguments that are provided in the party manifestos has been investigated. Before 1977, nuclear energy was hardly or not politicized but was seen as an important technological development. It would stimulate the Dutch economy and was therefore also framed as economically valuable. After 1977, the focus shifted towards safety risks and issues with waste storage related to nuclear power. All arguments have been classified into four framing categories; environmental, economic, scientific/political, and civil society. While the civil society frame is most frequently used, it is also the frame with the least diversity in arguments. Many of the arguments are often re-used, whereas arguments in other frames tend to shift regularly. Mentioning risks related to safety is considered to be an execution of politics of fear. Overall, it can be concluded that there is not one way to describe the framing of nuclear energy in House of Representatives party manifestos during the 1967-2021 elections. However, the presented paper has provided a framework with four framing categories that can be used to analyze party manifestos. The longitudinal aspect of the study ensures a broad overview of attitudes towards nuclear energy in the Netherlands over a period of more than 50 years.

Abovementioned findings are specific to the Dutch case, but the study is considered to be internationally replicable. This would essentially not be the case for all countries, since party manifestos are not universally given. However, the framework could be used to analyze a broader range of documents. Besides, while the framework was specifically tailored to analyze the topic of nuclear energy, it could potentially be used in the analysis process of framing other topics in party manifestos. The current study did not only add to the existing body of literature on political framing by gaining insights in the Dutch context of House of Representatives party manifestos from 1967-2021, it has also concluded on a ready-to-use conceptual framework to analyze the use of frames in political documents by identifying four framing categories. While the Dutch case is very specific and consequently not particularly generalizable, for example due to the extremely low share of nuclear energy, it might be true that results from other countries can be more easily generalized.

Future research could replicate the current study to gain insights on other contexts, or perform a comparative study. Furthermore, a comparison based on political orientation of the parties would be a fitted continuation.

6. Appendices

6.1 References

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6.2 Additional figures

Figure 5

Frequency of the use of the word ‘kernenergie’ in Dutch House of Representatives party manifestos, 1967-2021

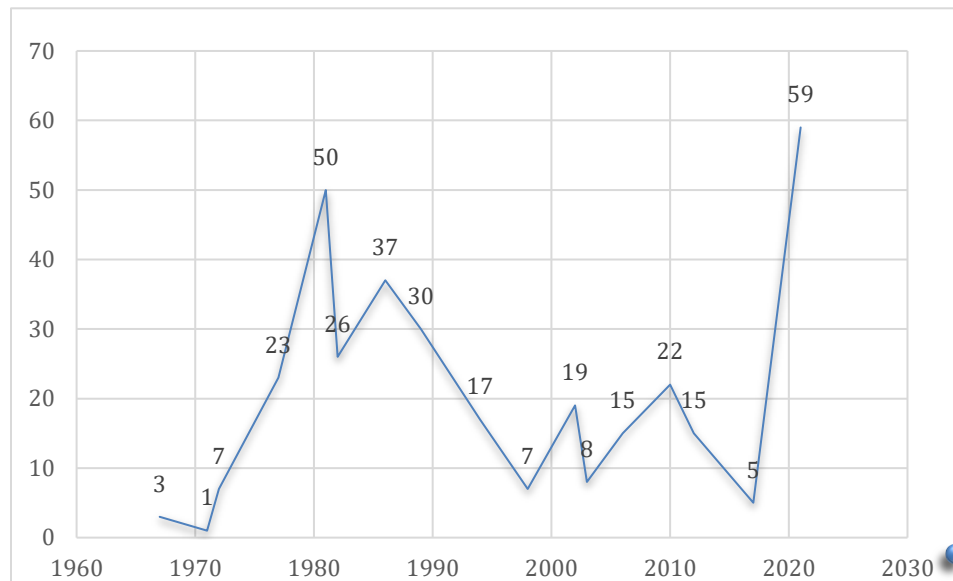


Figure 6

Frequency of the use of the word 'kerncentrale' in Dutch House of Representatives party manifestos, 1967-2021

