

Forces Underlying Incumbents' Behaviour regarding Sustainability Transitions in the Dairy Processing Industry in the Netherlands

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ABSTRACT,

Currently, the world faces various environmental and sustainability challenges, and sustainability transitions are more than needed. Since the dairy industry is among the most polluting industries in the world, sustainability transitions are also needed in this industry. While it has been recognised by previous research that incumbents can play a large role in sustainability transitions, a need was identified for a better understanding of incumbents' roles, motivations and behaviours in sustainability transitions in the dairy industry. Given this need, this paper seeks to provide a clear understanding of the forces at play that influence the decisions of incumbent dairy processing firms in the Netherlands whether to participate in sustainability transitions or not. Through conducting interviews with experts in the field, this study obtained first-hand knowledge on the constellation of forces influencing incumbents' behaviour in sustainability transitions. Finally, this study provides an understanding and clear overview of the different forces at play and conflicts between different forces, through which the constellation of forces at play can be understood.

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Keywords

Sustainability transitions, Incumbents, Dutch dairy industry, Dairy processing, Lewin's field theory, Forces

1. INTRODUCTION

The field of sustainability transitions has been an emerging topic in research, shown by growing interest and progress made in recent years (Farla et al., 2012; Fischer & Newig, 2016; Köhler et al., 2019; Markard et al., 2012). Because of the many environmental and sustainability challenges the world faces, such as air pollution, land degradation and depletion of natural resources, sustainability transitions are more than needed (Bhat et al., 2022; Vermeulen et al., 2012). Among the sectors with the biggest share in greenhouse gas emissions globally are the energy (73.2%), industry (18.4%) and agriculture (5.2%) sectors (Ritchie & Roser, 2020). Besides the impact these industries have on the existence of environmental and sustainability challenges, they are also affected by these challenges in the sense that these challenges require industries to move toward more sustainable practices in order to reduce their environmental impact (Arora et al., 2018; Poore & Nemecek, 2018).

One of the industries that relates a lot to today's environmental challenges is the food industry. The food industry has a direct impact on the depletion of natural resources, such as animals and plants, and is responsible for 26% of global greenhouse gas emissions (Poore & Nemecek, 2018; Ritchie et al., 2022). Within the food industry, the dairy industry is one of the most polluting industries and has a significant effect on the environment, among others by greenhouse gas emissions and highly polluted waste (Brião & Tavares, 2007; Feil et al., 2020; Milani et al., 2011; Rad & Lewis, 2013). To overcome these environmental and sustainability challenges and to ensure a globally competitive and sustainable dairy industry in the future, the food and dairy industry have to move toward more sustainable practices (Augustin et al., 2013; Bhat et al., 2012; Borsellino et al., 2020).

A recent literature review on sustainability in the dairy industry conducted by Feil et al. (2020) shows that sustainability in the dairy industry has become an increasingly relevant topic, given that publications on this topic have significantly increased since 2011. Since, several studies on sustainability in the dairy sector have been conducted, such as on sustainability indicators (Feil et al., 2020), understanding the environmental impacts of dairy processing (Finnegan et al., 2018a; Milani et al., 2011) and outlining technologies that can help to improve sustainability in the dairy sector (Finnegan et al., 2018b).

A group of actors that has significant influence on sustainability in the dairy industry are incumbent firms. As incumbents have strong positions compared to new companies in the market, who are often the first to develop environmental innovations, they can exert great influence on sustainability transitions and the breakthrough of environmental innovations (Geels, 2011). Although it is recognised that incumbents can have significant influence on the success of sustainability transitions, further research is needed on their roles, motivations and behaviours in these transitions (Huttunen et al., 2021).

Despite increasing efforts in research on sustainability in the dairy industry, not much focus has been put on the role and behaviour of incumbent firms. Although Dewick & Foster (2011) investigated how those actors who have significant market power in the milk production system can facilitate some innovations whilst opposing others, there is still lack of an understanding of the motivations and reasons behind these behaviours of incumbents in sustainability transitions in the dairy industry. Also in the field of sustainability transitions research has been done on actors and their agency in sustainability transitions (Fischer & Newig, 2016; Huttunen et al., 2021), but there is still a need for a better understanding of incumbents' motivations and behaviour in sustainability transitions (Huttunen et al., 2021; Turnheim & Sovacool, 2020).

As it remains unclear what influences incumbents' decisions to participate in transitions or oppose them, this paper aims at providing an understanding of the drivers and barriers that influence incumbents' behaviour in sustainability transitions in the dairy industry.

Since the worldwide dairy industry comprises a large number of incumbents from different countries, and drivers and barriers may differ between countries, this research specifically focuses on the dairy industry of one country, namely the Netherlands.

In the Netherlands, the dairy industry is with a total production value of €8.1 billion in 2021 one of the driving forces behind the economy (ZuivelNL, 2021) and Dutch dairy cooperative FrieslandCampina is among the top 10 largest dairy cooperations in the world with a revenue of €11.5 billion in 2021 (Rabobank, 2022). Moreover, the Netherlands was the third largest exporter of milk in 2020 (OECD, 2022), which shows their importance in the world dairy industry.

Since the dairy industry in the Netherlands is a large industry consisting of multiple sectors, this paper particularly focuses on incumbents in the dairy processing industry. After on-farm production, this industry is the largest contributor to greenhouse gas emissions within the dairy industry (Milani et al., 2011). Given the need for sustainability transitions in the dairy industry (Borsellino et al., 2020), and the large contribution of the dairy processing industry to greenhouse gas emissions in the dairy industry (Milani et al., 2011), the dairy processing industry also needs to shift towards more sustainable practices.

In order to understand and explain incumbents' behaviour regarding sustainability transitions, Kump (2023) suggests the use of Kurt Lewin's field theory (Lewin, 1951). Kump (2023) argues that Lewin's field theory can be useful in explaining incumbents' behaviour regarding sustainability transitions by considering the constellation of forces that influence incumbents' behaviour and shifts in the constellation of forces.

Therefore, this research will use Lewin's field theory as theoretical framework with the aim to explain incumbents' behaviour in sustainability transitions in the dairy processing industry by identifying the constellation of forces influencing incumbents' behaviour regarding these transitions and the conditions under which the constellation of forces would change.

Following the identified research gap, the research question this paper aims to answer is:

"What are the forces at play among incumbents in the Dutch dairy processing industry in their decisions to participate in sustainability transitions?"

After identifying the forces, a model of the constellation of forces influencing incumbents' behaviour regarding sustainability transitions in the dairy processing in the Netherlands will be presented. The model will provide an overview of the driving and opposing intrinsic and extrinsic forces at play influencing incumbents' behaviour regarding sustainability transitions.

This paper contributes to research on the topic of sustainability transitions, specifically in the dairy industry, by providing new insights on forces that influence incumbents' behaviour in these transitions. By using Lewin's field theory as theoretical framework, one is able to understand incumbents' behaviour based on the constellation of forces that influence their behaviour regarding sustainability transitions (Kump, 2023).

Furthermore, this paper shows that Lewin's field theory may indeed be of good use for providing an understanding of incumbents' behaviour in sustainability transitions. This paper may thus motivate other researchers in other fields to also use

Lewin's field theory to understand the behaviour of incumbents and the context influencing their behaviour.

This paper also makes a contribution to the process of improving sustainability in the dairy (processing) industry. By providing a better understanding of the constellation of forces behind incumbents' behaviour regarding sustainability transitions, and under what circumstances the constellation could change, the industry can act accordingly to drive incumbents into participating in sustainability transitions by developing effective policies or following particular strategies that would drive incumbents into participation.

2. THEORETICAL BACKGROUND

2.1 Sustainability transitions and the role of incumbent firms

In recent years, an increasing amount of research has been conducted in the field of sustainability transitions (Farla et al., 2012; Fischer & Newig, 2016; Köhler et al., 2019; Markard et al., 2012). Given the current environmental and sustainability challenges in the world, there is an increasing need for sustainability transitions (Bhat et al., 2022; Vermeulen et al., 2012). Markard et al. (2012) define sustainability transitions as: "long-term, multi-dimensional, and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption". According to Geels (2004), the deep structure that accounts for the stability of an existing socio-technical system is formed by the socio-technical regime, which refers to the semi-coherent set of rules that coordinate the activities of the social groups that reproduce the elements of socio-technical systems (Geels, 2011). Geels (2011) emphasises that the concept of the regime invites to investigate what lies underneath the activities of actors who reproduce system elements, i.e. to investigate the motivations and reasons why actors undertake particular actions.

Sustainability transitions are often driven by innovations created in 'niches' which are 'protected spaces' where radical innovations are worked on that deviate from existing regimes (Geels, 2011; Kump, 2023). Incumbents can play a large role in these transitions as they have strong positions in the market compared to new companies who are often the first to develop environmental innovations (Geels, 2011). Incumbents are often described as regime actors and defenders of an established socio-technical regime and systems and may prevent the breakthrough of niche-innovations (Farla et al., 2012; Geels, 2014; Huttunen et al., 2021; Köhler et al., 2019), but they may also use their power to influence and shape transitions efforts and support niche-innovations (Turnheim & Sovacool). It has been recognised that for sustainability transitions to succeed, it is essential that incumbents engage in these transitions and change their everyday behaviour (Huttunen et al., 2021; Magnusson & Werner, 2023). Because incumbents have complementary assets and resources, they have a strong market position compared to new firms that are often the first to develop environmental innovations (Geels, 2011). The involvement of incumbents in sustainability transitions may thus accelerate the breakthrough of niche innovations, as they can support these innovations by providing their complementary assets and resources (Geels, 2011).

2.2 Lewin's field theory

In order to understand and explain the forces underlying incumbents' behaviour regarding sustainability transitions in the dairy processing industry in the Netherlands, Lewin's field theory was used. The use of this theory as theoretical framework for understanding incumbents' behaviour was suggested by Kump (2023). Kump (2023) explains that Lewin's field theory

integrates both the individual and social processes underlying social change in a common theoretical framework.

According to Lewin (1951), behaviour is a function of the interaction between individual and social processes present in the field. The term field is used at both the individual and group level (Kump, 2023). In the individual context, there is mention of a psychological field which comprises of the characteristics of the individual and the characteristics of the environment as perceived by the individual, which in this study is the incumbent dairy processing firm (Kump, 2023; Lewin, 1951). In a group context, there is mention of a social field, which comprises of a set of actors who depend on each other for achieving certain goals and the environment as perceived by the whole group (Lewin, 1951).

Within both the individual's psychological field and the group's social field, field forces exist that drive certain behaviours (Lewin, 1951). These forces can either be intrinsic (personal/group values, needs, desires or resources) or extrinsic (market dynamics, subsidies, rewards or punishments) (Lewin, 1951). Kump (2023) emphasises that forces may vary in strength and these strengths may vary over time due to changes in circumstances and situations, which can change the behaviour of individuals and groups.

Since there are several forces at play at the same time, behaviour does not solely depend on one force, but rather on the constellation of the different field forces (Burnes & Cooke, 2013; Lewin, 1951). Within the constellation of field forces, Lewin (1946, 1951) identified the possibility of conflicts between opposing forces of equal strength, which influence the behaviour of the individual.

Within the constellation of field forces, shifts can take place when forces in favour of the change are stronger than opposing forces (Lewin, 1947). For the change to become permanent, the whole force field has to be changed such that the forces in favour of the change will be permanently stronger than the forces opposing the change (Kump, 2023; Lewin, 1947). Kump (2023) emphasises that incumbents' responses to sustainability transitions depend on the nature of change in the constellation of forces and force conflicts. For example, when forces towards new practices outweigh forces towards regime practices, and the regime change reduces force conflicts, incumbents are likely to participate in sustainability transitions, while if forces towards regime practices are stronger, incumbents resist participation in sustainability transitions (Kump, 2023).

2.3 Drivers and barriers of sustainability transitions in the dairy processing industry

In recent years, various studies have been conducted on the topic of sustainability within the dairy industry, with the topic becoming increasingly relevant in the field (Feil et al., 2020). While most research focuses on environmental challenges and the need for sustainability transitions in the industry (Augustin et al., 2013; Bhat et al., 2022; Finnegan et al., 2018a; Milani et al., 2011; Thongplew et al., 2016), not much focus has been put on the role and behaviour of incumbents in sustainability transitions in the dairy industry.

While little explicit research has been done on forces influencing incumbents' behaviour in the dairy industry, some forces can be identified in a few papers.

For example, Ter Bekke (2019) explains that significant increase in landscape pressure, e.g. because of new laws and regulations on sustainability coming into effect, can force companies in the dairy regime to adapt. As companies must comply with these laws and regulations, dairy companies are forced to adapt their practices and become more sustainable.

Although Ter Bekke (2019) emphasises that new laws and regulations can drive companies to participate in sustainability transitions, Mylan et al. (2019) point out that in some cases policymakers have actively hindered the diffusion of niche-innovations such as plant-based milk and mostly aligned with dairy-milk incumbents, which can thus be an opposing force for incumbents to participate in sustainability transitions and drives them to defend the regime.

Another force at play that could drive incumbent dairy processing firms to participate in sustainability transitions could be the increasing demand for more sustainable dairy products, given that the sales of plant-based milk sales increased by 9% whereas cow milk sales decreased by 6% (Schiano et al., 2020). Schiano et al. (2020) also mention that the total milk market share of plant-based dairy products is expected to double to 18.5% by 2023. The changing customer behaviour could thus encourage incumbents to make more sustainable products and drive them towards participation in sustainability transitions.

Although some forces have been identified in the literature, there is still lack of an understanding of the constellation of forces underlying incumbents' decisions to participate in sustainability transitions in the dairy processing industry in the Netherlands. As Huttunen et al. (2021) emphasised, further research is needed on incumbents' motivations and behaviour in sustainability transitions. Therefore, in order to understand the behaviour of incumbents' in these transitions, there is a need for new research on field forces influencing incumbents' behaviour regarding sustainability transitions.

3. RESEARCH DESIGN

3.1 Research method

In order to collect data and identify the forces behind incumbents' behaviour regarding sustainability transitions in the dairy processing industry in the Netherlands, this research followed a qualitative approach through conducting interviews with experts in the field and by conducting desk research (Babbie, 2019). The goal of conducting interviews was to gather first-hand knowledge from experts in the field of sustainability transitions in the dairy processing industry in the Netherlands. The interviews were semi-structured, meaning that there were a set of guiding themes and open-ended questions, but no strict order and not only preestablished questions were asked. This allowed for flexibility and follow-up questions to probe further into participants' answers, which ensured that the interviews could go more in depth (Babbie, 2019).

3.2 Sampling

For the interviews, a sample of 6 incumbents was taken from the population, which consisted of about 20 incumbent dairy processing firms in the Netherlands (COKZ, 2023; NZO, 2023; NZO, 2016). For this research it was assumed that incumbents themselves would be most relevant to help understand the behaviour of incumbents' regarding sustainability transitions and the forces that influence their behaviour. Therefore, a purposive sample was taken from the population, which, as Etikan (2016) emphasises, concentrates on a specific group with specific characteristics can be targeted who will be better able to assist with the relevant research. Using a purposive sample ensured that the sample taken was representative for the population consisting of incumbents in the Dutch dairy processing industry. However, a disadvantage from purposive sampling is that it can limit the generalisability of the findings to other populations (i.e. incumbents in other countries or industries).

In order to gather valuable and expert knowledge, a combination of a homogeneous and expert purposive sample was taken from the population. Homogenous purposive sampling aims at

achieving a sample consisting of participants who share the same characteristics or traits, while expert purposive sampling is useful when the research needs to gather knowledge from individuals that have a particular expertise and where there is currently a lack of observational evidence (Etikan, 2016; Rai & Thapa, 2015). As the aim of the interviews was to gather expert knowledge from a specific group on the forces at play, a combination of both sampling methods was used. To ensure that the interview participants were indeed experts in the field, some criteria were determined, which are displayed below in table 1.

Table 1. Criteria for selecting interview participants

CRITERIA
1. Participant had to be employed by an incumbent dairy processing company in the Netherlands
2. Participant should have at least 3 years of work experience in the dairy processing industry
3. Participant had to be engaged in the field of sustainability and have expertise in the field of sustainability (e.g. had to have a sustainability-related job role, or in possession of a sustainability certification or followed education in the field of sustainability)

3.3 Data collection

In order to collect valuable data through conducting interviews with experts in the field, an interview guide was made which consisted of a few guiding themes, each of which contained a number of specific questions in order to ensure all relevant topics were covered. The guiding themes for the interview were personal motivations for sustainability, general trends in the industry, relevant forces at play influencing the incumbents' decision whether to participate in sustainability transitions or not, general forces in the industry and force conflicts. To ensure the validity of the interviews, the interview questions were based on existing theory and findings from other studies. The interview questions were drawn up using Lewin's (1951) field theory as theoretical perspective and were also based on previous work in the dairy industry. By basing the questions on existing theory and findings, content validity was enhanced as it ensured that the questions asked were relevant to the topic and that all aspects of the concept being measured were covered (Babbie, 2019). Another way through which the validity of the interviews can be ensured is to ask all participants the same questions in the same way. However, in a semi-structured interview, there is more flexibility than in a structured interview, which made it more difficult to ask the same questions to each participant in exactly the same way. This issue has been reduced by already preparing a few possible follow-up-questions, so that for the different interviews the same follow-up-questions were used when needed (Babbie, 2019).

Eventually, through the interviews, data was collected from experts on the forces behind the incumbent's behaviour in sustainability transitions. As the data was collected directly from incumbent firms in the dairy processing industry in the Netherlands, the data can be considered reliable as the participants have first-hand knowledge and experience on the topic. However, the reliability of this first-hand knowledge can also be questioned, as participants could have given answers that are socially desirable or benefit their own businesses. In order to limit this issue, Bergen & Labonté (2020) and Schwarz (1999) emphasise the use of follow-up questions that probe for more accurate and truthful information as a way to limit social desirable responses. Thus, to limit this social desirability bias, the interviewees were asked and encouraged to provide examples and give more details on certain answers.

In addition to the data collected from the interviews, data on forces was also collected through desk research. The desk research was conducted alongside the interviews in order to gain a better understanding of the context and the potential forces at play. Also, by combining field research with desk research, the validity of the research design was enhanced as different ways of gathering information can supplement each other (Zohrabi, 2013). Conducting desk research in addition to field research thus ensured that all aspects of the concepts being measured were covered. Through the desk research, some driving and opposing forces for incumbents in the Dutch dairy processing industry to participate in sustainability transitions were identified. These forces were compared to the forces identified through the interviews to see if there were similarities or differences.

3.4 Data reduction and data analysis

In order to ensure that all answers were captured correctly, the interviews were recorded and transcribed. To make sense of the data gathered from the interviews, and identify the forces underlying incumbents' behaviour the transcripts were coded. With the use of coding, unstructured data can be structured by categorising excerpts from the transcripts into themes and patterns (Delve, 2020). For the coding, a mix between a deductive and inductive method was used. As in the literature review and the desk research, a few possible forces that might influence incumbents' behaviour had been identified, a deductive method was used as these identified forces could be used as a basis to categorise forces mentioned in the interviews along predetermined types of forces. As the interview participants could also mention forces that were not found in the literature, also an inductive coding approach was used. With inductive coding, codes will be derived from the data itself (Delve, 2020). This ensured that also relevant forces that had not been mentioned or found in the literature would be taken into account.

After all transcripts were coded, different types of forces and force conflicts were identified with the use of Lewin's field theory as theoretical framework. By identifying different types of forces and force conflicts, the constellation of forces driving incumbents' behaviour could be identified. Eventually, the identified constellation of forces is presented in a model that provides a clear overview of the forces at play in sustainability transitions in the dairy processing industry in the Netherlands.

4. RESULTS

The following section discusses the results obtained through the interviews. The aim of conducting interviews with dairy industry experts in the Netherlands was to find out the underlying forces behind their decisions to participate or not in sustainability transitions. The results on forces will be discussed by category and its sub-categories. When referring to statements made by particular interview participants, the abbreviation IP, with the number of the interview participant, is used.

4.1 The incumbent

First of all, during the interviews, forces have been identified that are at play within the incumbents themselves that influence their decisions to participate in sustainability transitions. The following forces have been identified that are at play within the incumbent dairy processing firms themselves:

4.1.1 High importance of sustainability for incumbent

During the interviews, the importance of sustainability for the incumbents and their intrinsic motivation to sustainability has been identified as a force that influences their decisions to participate in sustainability transitions (IP1, IP2, IP4, IP5). For instance, IP2 mentioned that sustainability is in the company's genes. They believe in the need to leave the world better than we

came here and are intrinsically motivated to work on sustainability throughout their entire chain. Similarly, IP5 indicated that sustainability is one of the main pillars of their business. If they have the opportunity to become more sustainable, they will do so. In contrast, IP4 indicated that sustainability is not yet intrinsic to their business, but that their intrinsic motivation for it is increasing.

4.1.2 Optimising business processes and improving efficiency

Another force that has been identified is the focus of incumbents on optimising business processes and improving their efficiency (IP 1, IP2, IP3, IP4, IP5, IP6). The interviewees expressed its importance as by optimising their business and improving efficiency, e.g. regarding resources, incumbents can save money by being able to produce the same output with fewer input.

As fuel prices rise, many companies are looking to become more energy efficient to save money (UN Environment Programme, 2022). For example, IP1 told that they have installed a heat pump that saves almost 1/3 of their gas consumption, making them more energy efficient. In addition, IP5 stressed that they are constantly working on becoming more efficient and thus working on the reuse of resources such as steam, gas and electricity to do so. Furthermore, IP2 emphasised that a motivation for them to participate in sustainability transitions is that by taking advantage of new techniques and innovations, they can optimise their business and increase their efficiency. Furthermore, IP4 mentioned that the dairy industry is a very energy intensive industry, which poses a challenge for incumbents in the industry to become more sustainable. But IP4 also explained that, especially with rising gas prices, this challenge also acts as a driver to participate in sustainability transitions as it forces incumbents to look for more sustainable and efficient energy sources in order to save money.

4.1.3 High importance of sustainability among employees

The interviews also highlighted the role employees play in incumbents' decisions to participate in sustainability transitions (IP1, IP2, IP4, IP5). The interviewees emphasised that they value input from employees regarding sustainability. IP4 told that they encourage employees to come up with ideas for the business regarding sustainability and that quite a few employees already responded with a lot of ideas as well. IP4 mentioned that all ideas will be considered and evaluated to see if they can be implemented. Also IP5 emphasised that they encourage employees to come up with ideas regarding sustainability because they often see very different things than management sees, which helps the incumbents getting ideas other than standard ideas. As a result of encouraging employees to bring in ideas, and many ideas on sustainability are brought in by employees, incumbents may be encouraged to participate in sustainability transitions.

4.2 The market

Besides forces at play within the incumbent firms, there are also forces within the market the incumbents operate that influence their decisions regarding participation in sustainability transitions. Within the market, the following forces have been identified:

4.2.1 Competition and sustainability efforts of competitors

Within the market the dairy processing incumbents operate, competition and the sustainability efforts of competitors has been identified as a force that drives incumbents into participating in sustainability transitions (IP1, IP2, IP3, IP6). IP2 and IP3

explained that nowadays working on sustainability is a licence to produce and is about future-proofing the business. If incumbents don't do it, there are few opportunities for them to do business and at some point they will be out of business. Furthermore, IP3 stressed that you should always be ahead of competition. If the competitor is operating smarter and better in terms of sustainability, the incumbent must ensure that advancements will be made to get back ahead of competition in terms of sustainability. Thus, competition could encourage them to participate in sustainability transitions.

4.2.2 Partnerships

Partnerships between different actors in the dairy processing industry have also been identified as a force that can drive incumbents into participating in sustainability transitions (IP1, IP2, IP3, IP4, IP5, IP6). IP6 explained that the dairy industry is a very organised sector in which a lot of information is shared with each other at different levels. IP1 and IP5 emphasised that within these partnerships, knowledge is shared and best practices are exchanged with each other. Because of the partnerships with other dairy processing companies, they can learn from each other's ideas, both good and bad ones, which helps them understand what works and what not. By participating in partnerships, incumbents have more information about successful sustainability initiatives, which can encourage them to participate in sustainability transitions and implement the successful sustainability initiatives of other dairy processing companies in their own businesses.

4.2.3 Availability of more sustainable practices

Another force within the market that has been identified is the availability of more sustainable practices (IP1, IP2, IP3, IP5, IP6). For instance, IP1 mentioned that the cheap availability of alternatives can enhance sustainability of the whole dairy industry. If cheap alternatives to current practices are available, incumbents can be encouraged to participate in sustainability transitions. But in some cases, as IP2 and IP6 emphasised, companies wait with implementing certain sustainable practices because a better practice is in the making and will come on the market in the future. As a result, incumbents wait until this better and more promising practice comes on the market instead of first investing in implementing the lesser measure while a better measure comes on the market soon. Furthermore, IP1 and IP6 mentioned that companies always have to make use of the best available techniques. Thus, if better and more sustainable techniques are available, incumbents have to use these, which drives them to participate in sustainability transitions.

4.2.4 Labour shortage

Lastly, within the market, also the lack of availability of labour has been identified as a force that can influence incumbents' decisions to participate in sustainability transitions (IP1, IP3, IP4). IP1, IP3 and IP4 all mentioned the challenge of having enough people available to implement the more sustainable practices within the company. In addition, IP3 explained that staff retention and recruitment is among the biggest challenges of companies right now. As result of incumbents not having enough employees and having difficulties to recruit employees to implement sustainable practices, they may oppose participation in sustainability transitions.

This force may conflict with other forces such as the importance of sustainability for the incumbent. When incumbents are intrinsically motivated to work on sustainability, but do not have enough people to implement the sustainable practices, it becomes difficult for them to participate in sustainability transitions and thus they may keep defending regime practices.

4.3 Laws, regulations and agreements

It has also been found that legislative forces are influencing incumbents' decisions to participate in sustainability transitions. Regarding legislation, the following forces have been identified:

4.3.1 International agreements

In order to address environmental challenges several international agreements have been concluded between countries, such as the UN Paris Agreement, the European Green Deal and the UN Sustainable Development Goals (European Commission, 2019; UNFCCC, 2015; United Nations, 2023). These agreements have set specific goals and targets for countries to achieve. Some agreements, such as the Paris Agreement, are legally binding, meaning that countries are obliged to pursue domestic mitigation measures to reach the targets (UNFCCC, 2015). Other agreements, such as the UN Sustainable Development Goals, may not be legally binding but have been adopted by all United Nations member states (United Nations, 2023). Also the international dairy industry made a commitment to the SDG's by signing the Declaration of Rotterdam, which addresses the role of the dairy industry with regard to sustainability (SDG Nederland, 2016).

During the interviews, the influence of these international agreements on incumbents' behaviour was mentioned as a central theme (IP1, IP2, IP3, IP4, IP5, IP6). For example, IP3 told that these international agreements have a very big impact on incumbents' decisions to participate in sustainability transitions as it results in legislation on sustainability that companies are obliged to comply with, which thus forces them to participate in sustainability transitions. Furthermore, IP4 stressed that the requirements for international agreements are constantly being scaled up a bit. This means that, at some point, incumbents have to make further improvements and participate in sustainability transitions in order to meet the requirements set by the international agreements.

4.3.2 (Inter)national laws and regulations

Besides international agreements, which can drive incumbents into participating in sustainability transitions, there are also (inter)national laws and regulations that have been identified as a driving force at play (IP1, IP2, IP3, IP4, IP5, IP6). For instance, IP1 explained, for example, that national laws and regulations such as the Energy Saving Investigation & Notification Obligation require them to report information on among others their plant's energy consumption. These laws & regulations require them to draw up an energy audit plan every four years detailing what they will do to save energy in the coming four years, which forces them to participate in sustainability transitions. Furthermore, IP4 described that also international regulations such as the Corporate Sustainability Reporting Directive force incumbents to participate in sustainability transitions as it requires them to develop policies regarding sustainability within their companies, which they will also be audited on. Also IP5 highlighted the large influence laws and regulations have on sustainability in the dairy industry. As legislation becomes stricter, it becomes more important for incumbents to take action on sustainability and thus participate in sustainability transitions. In addition, IP3 and IP6 explained that also the EU Emissions Trading System forces incumbents to participate in sustainability transitions and reduce their CO2 emissions as it forces them to buy rights for additional CO2 emissions. The Dutch government is also steering towards reducing CO2 emissions through regulations such as levies and taxes on energy use. These regulations make it increasingly unattractive to use energy, thus forcing incumbents to become more sustainable and to participate in sustainability transitions.

4.4 Customers

It has also been found that customers play a large role in the decisions of incumbents to participate in sustainability transitions. Regarding the customers of the dairy processing firms, it has been identified that their changing behaviour and attitude play a large role in influencing incumbents' behaviour regarding sustainability transitions.

4.4.1 Customer behaviour and attitude

In recent years, demand and spending on sustainable products has increased with an increase of 11% in demand for sustainable dairy products in 2020 (Wageningen University & Research, 2021). In both 2019 and 2020, dairy products were among the top two product groups with the largest increase in demand and spending on sustainable products (Wageningen University & Research, 2020, 2021). Although the demand and spending on sustainable dairy products has increased in recent years, the demand for more sustainable products, which are often more expensive, has reduced since 2021 as a result of a decline in purchasing power (LTO Nederland, 2022). If incumbents cannot make profit by becoming more sustainable and producing and offering more sustainable products, they will not do it (LTO Netherlands, 2022). Thus, consumer behaviour can play a large role in incumbents' decision to participate in sustainability transitions.

In the interviews, the role of customers was often mentioned as an important force in incumbents' decisions to participate in sustainability transitions (IP1, IP2, IP3, IP4, IP5, IP6). IP1, IP3, IP5 and IP6 all expressed that customers are increasingly demanding more sustainable products that take environmental impact into account. In addition, IP3 emphasised that the market decides what the producer makes, as the market is where the products are ultimately sold to. If sustainability is important to customers and they are demanding more sustainable products, then the producer must meet those demands and thus participate in sustainability transitions.

However, although customers in the Netherlands are demanding more sustainable products and saying sustainability is important to them, IP3 explained that this is not reflected in their buying behaviour. IP3 said that customers in the Netherlands often choose the cheapest product instead of the most sustainable product, which is also supported by IP1 who said the Dutch are generally frugal. IP3 adds that especially in the current conditions of huge inflation and high costs, customers are not buying the more sustainable products, given the higher price of sustainable products. Also IP1 mentioned that in the Netherlands the price is very decisive and people look for the cheapest option. IP1 and IP6 stressed that if customers are not buying the more sustainable products due to its high price, it will be tough for the dairy producer to sell sustainable products as with lesser demand the price will fall and the producer will not sell the products at a lower price than the cost of production. This can result in the incumbent not producing these more sustainable products and thus not participating in sustainability transitions, even though they might have intrinsic motivation to become more sustainable.

4.5 Financial

The behaviour of incumbents in the dairy processing industry regarding sustainability is also being influenced by financial factors. In the desk research and interviews, the following financial factors have been identified:

4.5.1 Financial resources and capability

One of the financial forces that has been identified during the interviews is the financial capability of incumbents and the financial resources they possess. (IP1, IP3, IP4, IP5, IP6). For

example, IP1 mentioned that having sufficient financial resources are important to help businesses become more sustainable and can thus drive incumbents towards participating in sustainability transitions. Furthermore, IP4 indicated that, given the high cost of implementing sustainable practices, having sufficient financial resources are a challenge for them in participating in sustainability transitions and implementing more sustainable practices. In addition, IP6 explains that the costs of more sustainable practices, such as a heat pump, are often so high that they are not attractive at all for businesses, given their financial capabilities and other projects they may be prioritising. Furthermore, IP5 explained that incumbents that are under pressure in terms of profits and capital often decide to drop sustainable investments first to keep their business going. Thus, the financial capability of incumbents, which is also dependent on the state of the economy, influences their decisions whether to participate in sustainability transitions or not.

4.5.2 Subsidies and permits

Subsidies and permits granted by the government for investments on sustainable practices has also been mentioned as a central theme during the interviews (IP1, IP2, IP4, IP6). For example, IP1 explained that an important force in their decision to implement a heat pump in their factory was that they received many subsidies on it. Since investments in sustainability often cost a lot, subsidies can motivate incumbents to actually make the investment. IP1 also explained that making subsidies more accessible could help motivate companies to do the large investments in sustainable practices and thus participate in sustainability transitions. In addition, IP6 stressed that the government can help by granting subsidies in certain cases where companies do not have the financial resources to make these large investments in sustainability or when the investments are not profitable for them. Thus, subsidies granted by the government for investments on sustainable practices increase the financial capability of incumbents and can encourage them to make the investment and participate in sustainability transitions.

However, it should also be taken into account that currently, as IP2 highlighted, the process for permits and licenses is very lengthy one. If an incumbent wants to invest in a sustainable practice which they need a permit for, it can take a long time before they receive the permit and get everything done. The long process of licensing can discourage incumbents from participating in sustainability transitions.

4.5.3 Return on investment and payback period

Another financial force that has been identified during the interviews is the return on investment and the payback period of investments in sustainable practices (IP1, IP2, IP4, IP5, IP6). For example, IP1 stressed that investments in sustainable practices should also be profitable, in addition to the savings that can be made with the more sustainable practices. They have set a guideline of recovering the investment within 5 or 6 years, if that's not the case, they will not do the investment in the more sustainable practice. Also IP5 stressed the importance of keeping investments in sustainable practices profitable and indicated that making these investments profitable is a big challenge these days. IP5 explained that they had a project with solar panels that turned out to be cost-neutral but yielded nothing. Then you do it for the environment, but in the end you have no profit from the investment, while making profit is important to keep the business running. Furthermore, IP4 indicated that a big challenge in implementing more sustainable practices is that a lot of investments have a too long payback period, which can make it unattractive for companies to make the investment in sustainable practices. IP4 mentioned the payback period of investments in sustainable practices can be shortened as result of rising energy

prices, which can thus drive incumbents into participating in sustainability transitions.

4.6 Resources

During the interviews, participants indicated that an important factor in incumbents' decisions to participate in sustainability transitions is their motivation to improve their business and increase their efficiency. Closely related to this force, another important force has been identified during the interviews, namely the resources incumbents need to keep the business and its processes going. Regarding the resources, the following forces have been identified:

4.6.1 *Low availability and accessibility of (natural) resources*

Regarding the resources incumbents use to keep their business and its processes going, the low availability and accessibility of (natural) resources has been identified as a force holding incumbents back from participating in sustainability transitions (IP1, IP2, IP3, IP6). All participants mentioned that one of the biggest challenges for incumbents to participate in sustainability transitions is the availability of electricity. IP3 explained that they focus a lot on their energy consumption, but that a big bottleneck in becoming more sustainable on energy is that the electricity infrastructure in the Netherlands is currently unsuitable for the high demand caused by companies shifting from gas to electricity as their main energy source. Also IP1 and IP6 stressed that the current electricity infrastructure is not sufficient for such a high demand, which makes electricity as main energy source currently inaccessible for most companies. This can hold incumbents back from participating in sustainability transitions as more sustainable practices such as e-boilers or a heat pumps require a lot of electricity but they cannot get the electricity supplied. Furthermore, IP1, IP3 and IP6 also stressed that the availability of water will be a major challenge in the future and action needs to be taken. Especially since, as IP6 explained, a lot of water is used in factories for the production of dairy products, dairy processing companies are forced to participate in sustainability transitions and become more sustainable in terms of water use. Thus, the low availability of (natural) resources can both drive incumbents to participate in sustainability transitions and hold them back from participating. This also means this force can conflict with the force of incumbents wanting to optimise their business and improve their efficiency as with the low availability of electricity, it will become difficult for incumbents to switch from gas to electricity and become more energy efficient.

4.6.2 *Increasing prices of (natural) resources*

Another force regarding the resources used by incumbents to run their business that can influence their decisions to participate in sustainability transitions that has been identified is the increasing prices of (natural) resources (IP1, IP4, IP6). Because of the current high prices for gas it is increasingly attractive for companies to become more sustainable and reduce their gas use (Keijzer-Baldé, 2023). This statement is supported by several interviewees. For example, IP1 explained that with rising gas prices, their investment in installing a heat pump in their factory turned out to be a good solution. By implementing a more sustainable practice, they did not have to bear the burden of higher gas prices. Furthermore, IP2 and IP6 mentioned that higher prices for energy are an additional motivation for incumbents to reduce their energy consumption and can drive them into participating in sustainability transitions. All energy that incumbents do not use, they do not have to buy. Thus, by reducing their energy consumption and becoming more energy efficient, incumbents can avoid increased spending on energy as

result of higher energy prices, and they may thus participate in sustainability transitions.

While high gas prices may force incumbents to switch from gas to, say, electricity as the main source of energy, this may conflict with the aforementioned force of low availability of (natural) resources such as electricity. It was noted that there is not enough electricity available and that the electricity infrastructure is inadequate for current high demand, which could make it difficult for incumbents to switch from gas to electricity. As a result of this conflict, they may not participate in sustainability transitions and thus they will have to bear the burden of high gas prices.

4.7 Farmers

Finally, it has been identified during the interviews that farmers, who supply milk to dairy processors, also play an important role in the decision of incumbents to participate in sustainability transitions.

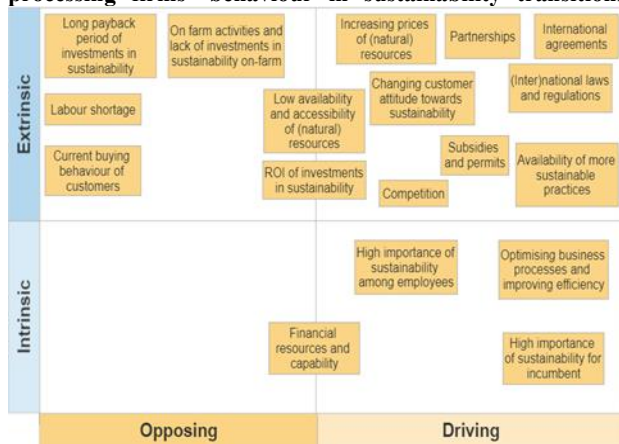
4.7.1 *On-farm activities and lack of investments in sustainability on-farm*

During the interviews, the role of on-farm activities and the decisions of farmers whether to invest or not in sustainability on-farm was also mentioned as a central theme (IP1, IP2, IP3, IP4, IP6). IP1 and IP2 expressed that currently, there is a lot of uncertainty among farmers due to new government measures, including measures on nitrogen emissions. IP1 explained uncertainty among farmers about the future of their business is holding farmers back from investing in sustainability. Even though farmers are willing to shift to more sustainable practices, they experience difficulties in doing so because of the uncertainties about their future (NOS, 2023). IP2 mentioned that more clarity is needed for farmers so that they are more inclined to make investments in sustainability again. For dairy processing firms it is necessary that farmers make investment in sustainability given that 90% of the footprint of dairy products such as cheese is determined by the footprint of raw milk, which is produced on-farm. But, as IP2 and IP3 emphasised, it is difficult for farmers to reduce the footprint through reduction as cows will always emit. Furthermore, IP3 explained that farmers becoming more sustainable is a long term project. There are no quick fixes for farmers to become more sustainable, mainly because they work with animals and because there are also many factors on the farm that affect the footprint but are beyond the farmer's control, such as the weather. Also, IP6 stated that the supply of sustainable dairy products is dependent on what farmers do about sustainability on-farm. Thus, the decisions of farmers whether to invest or not in sustainability and their on-farm activities influence the decisions of incumbent dairy processing firms to participate in sustainability transitions.

4.8 Model

Having identified several forces influencing incumbents' decisions to participate in sustainability transitions, a model has been created that provides a clear overview of these forces. For the model, the forces have been categorised into intrinsic and extrinsic forces on the one hand, and driving and opposing forces on the other. Some forces, such as the low availability of (natural) resources, have been identified both as driving and opposing forces and are therefore placed in between the driving and opposing category.

Figure 1. Forces influencing Dutch incumbent dairy processing firms' behaviour in sustainability transitions



5. DISCUSSION

5.1 Interpretation of results

In the following section, the results of this research are interpreted and explained. Also will the results be compared to the findings of the literature review.

A need had been identified for a better understanding of incumbents' motivations and behaviour in sustainability transitions (Huttunen et al., 2021; Turnheim & Sovacool, 2020). Since research on the dairy industry had not addressed this topic much, this research aimed at providing a better understanding of the forces at play influencing the behaviour of incumbent dairy processing firms regarding sustainability transitions.

Through conducting interviews with experts in the field and by complementing the data with findings of desk research, forces influencing incumbents' behaviour in sustainability transitions in the Dutch dairy processing industry were identified. The data collected suggest that there are several forces at play influencing incumbents' behaviour at the same time. It was also found that different forces are interdependent, and that changes within these forces can change the constellation of forces, which can change incumbents' behaviour regarding sustainability transitions. The different forces identified have been categorized alongside 7 themes, which were the incumbent, the market, laws & regulations, customers, financial, resources and farmers.

5.1.1 The incumbent

In the interviews, it was identified that there are forces within the incumbent firm itself that influence their behaviour regarding sustainability transitions. One of the forces mentioned was the high importance of sustainability and the incumbents' intrinsic motivation for sustainability. According to Lewin (1951), this force can be classified as an intrinsic force, given that this force concerns the personal values, norms and desires of the incumbent. The interviews revealed that sustainability has become an increasingly important theme for dairy processors, and also their employees, and has become one of the main pillars within their businesses. That sustainability has become an increasingly important topic in the dairy industry is confirmed by Feil et al. (2020), who showed that publications on this topic had significantly increased since 2011.

Also the motivations of incumbents to optimise their business and efficiency was identified as a driving force towards participation in sustainability transitions. This force was not mentioned in the literature, and identifying this force through the interviews thus provided new insights on forces influencing incumbents' behaviour. This force indicates the presence of forces that drive incumbents to participate in sustainability

transitions primarily for their own benefit. Although in some cases incumbents may initially participate in sustainability transitions primarily for their own benefit, their participation has a positive effect on sustainability across the sector, given the important role of incumbents in sustainability transitions as they can help accelerating niche-innovations by providing their complementary assets and resources (Geels, 2011).

5.1.2 The market

During the interviews, it had been identified that both competition and partnerships are drivers for incumbents to participate in sustainability transitions. While interviewees expressed the need to stay ahead of competition as driver to participate in sustainability transitions, they also emphasized that the dairy industry is a very organised industry where a lot of dairy processing companies collaborate with each other in terms of sharing knowledge and discussing developments. Although competition and partnerships between dairy processing firms as driving forces to participate in sustainability transitions seem to contradict each other, it was identified during the interviews that these forces do not contradict but complement each other. With partnerships knowledge about sustainable practices is shared between different actors, incumbents may be encouraged to implement these sustainable practices and participate in sustainability transitions. As competitors may also implement these sustainable practices, as result of the knowledge shared within the partnerships, this further forces the incumbent dairy processing firm to make even more advancements in order to stay ahead of competition. This also shows the interdependence with other actors for participation in sustainability transitions, which thus shows that this is a force in the social field (Lewin, 1951).

It had also been identified through the interviews that incumbents are dependent on the availability of more sustainable practices for participation in sustainability transitions. As IP2 emphasized, incumbents sometimes wait for certain promising practices to come to the market, and thus decide not to participate in the sustainability transition at the moment, but decide to participate later. Thus, incumbents waiting for certain more sustainable practices to come to the market can slow down the current sustainability transition. Therefore, the availability of sustainable practices can largely influence the decisions of incumbents' to participate in sustainability transitions.

Finally, also labour shortage has been identified as a force within the market that influences incumbents' behaviour in sustainability transitions. Though this force was not identified by the literature on sustainability transitions in the dairy processing industry, the interviewees expressed the challenge of having enough people available to implement sustainable practices. This means that labour shortage can also slow down current sustainability transitions, as incumbents are unable to implement certain sustainable practices, even though they want to. This force related to market dynamics is an example of an extrinsic force in the social field, as it shows the interdependence between different actors, in this case the incumbents and employees, for becoming more sustainable (Lewin, 1951).

5.1.3 Laws & regulations

From the interviews, it was also identified that legislation plays a large role in incumbents' behaviour in sustainability transitions. Because of recent international agreements, such as the UN Paris Agreement or the European Green Deal, incumbents are forced to participate in sustainability transitions as these international agreements result in legislation which companies are obliged to comply with. From the interviews, it was understood that regulations and its requirements are constantly being scaled up and becoming stricter. This force was also identified by Ter Bekke (2019), who explained that new laws and regulations on

sustainability coming into effect can force many companies in the dairy regime to adapt. The findings of the interviews confirm this statement as the interviewees explained that new laws and regulations, such as the Energy Saving Investigation & Notification Obligation, require them to take more action regarding sustainability

During the interviews, laws and regulations were only mentioned as a driving force, while Mylan et al. (2019) pointed out that policymakers mostly aligned with incumbents and in some cases actively hindered the diffusion of niche innovations, thus being an opposing force to participate in sustainability transitions. That laws and regulations were mentioned during the interviews only as a driving force and not as an opposing force can be explained by the fact that a lot of national legislation stems from international legislation and agreements, and in recent years more and more international agreements such as the Paris Agreement and the Green Deal have come into being. These international agreements in recent years lead to more national legislation on sustainability and climate action that drive established companies to become more sustainable.

5.1.4 Customers

From the interviews, it was understood that the customers have a large role in the decisions of incumbent dairy processing firms to participate in sustainability transitions as their demand in products largely decides the type of products the dairy processing firms make.

In the literature, it was found that the sales of plant-based, more sustainable, milk has increased over the years and will increase further the coming years (Schiano et al., 2020). Although also in the interviews, the participants emphasized that customers are demanding more sustainable products and take environmental impact into account, some of the interviewees expressed that customers are currently not showing this changed attitude in their buying behaviour. The main reason for this can be explained because of the higher price of more sustainable products and due to the Dutch people being more frugal in general, as explained by IP1. An explanation for the difference between the contradicting findings between the literature and the interviews can be that whereas the study by Schiano et al. (2020) explains that there is an increase in sales of more sustainable (plant-based) milk in the world, this study only focuses on the Netherlands. Since there are cultural differences between countries, for example IP1 explained that Dutch people are in general more frugal, the buying behaviour of a specific country may differ from the global buying behaviour.

5.1.5 Financial

Also several financial forces were identified during the interviews, but were not identified in the literature in the field of sustainability transitions in the dairy processing industry. It was through the interviews that the financial resources incumbents possess and their financial capability play a large role in their decision to participate in sustainability transitions. Thus, this may be an important force in incumbents' decision as not having enough financial capability or resources could force incumbents to oppose participation in sustainability transitions, even though they might want to participate. In order to still encourage incumbents to participate in sustainability transitions, interviewees mentioned the importance of subsidies which increases their financial resources and capability. Thus, these forces are closely connected with each other and also show that changes in forces can change the constellation of forces. If an incumbent does not have enough financial resources to make the investment for a particular sustainable practice, they may decide not to participate in the sustainability transition. But if the government grants them subsidies for the investment, this could

encourage them to make the investment and participate in the sustainability transitions. This also shows that besides in the psychological field of the individual incumbent firm, financial forces are also at play in the social field, given the interdependence between several actors (Lewin, 1951).

5.1.6 Resources

Other important forces that had been identified were the low availability and accessibility of (natural) resources and the increasing price of (natural) resources. The interviewees explained that the low availability of among others electricity and the insufficient energy infrastructure can both drive incumbents into participating in sustainability transitions and hold them back from participating.

This force shows the interdependence of different forces and how changes in forces could change the constellation of forces and thus the behaviour of incumbents. For example, if the prices of (natural) resources go down again, incumbents could be less motivated to seek for more efficient, sustainable and cheaper alternatives, which could result in them not participating in sustainability transitions. But if the prices of (natural) resources increase again, incumbents may decide to seek for better alternatives and thus participate in sustainability transitions in order to become more efficient and save money. However, it should be taken into account that the incumbent is then also dependent on availability of more sustainable practices. This also shows that these resource related forces are at play in the social field, given the interdependence of several actors, for example the incumbents and developers of more sustainable solutions, to achieve certain goals, such as participation in sustainability transitions (Lewin, 1951).

5.1.7 Farmers

Lastly, through the interviews it was found that farmers play a large role in the behaviour of incumbent dairy processing firms in sustainability transitions. As farmers supply milk to dairy processing companies, dairy processing companies are very dependent on farmers for the production of dairy products. Because of the current uncertainty among farmers due to new government measures, e.g. regarding nitrogen emissions, farmers are more reluctant to making investments in sustainability. In the interviews it had been identified that if farmer do not invest in sustainability on-farm, it becomes more difficult for the dairy processing firm to become more sustainable, given that 90% of the footprint of dairy products is determined on-farm. This force also plays in the social field as it shows the interdependence between forces and different actors and how change of the constellation of forces can change incumbents' behaviour (Lewin, 1951). For example, if there is a demand among customers for more sustainable products, the dairy processing firm may decide to participate in sustainability transitions. But, if the farmer does not invest in sustainability on farm, it becomes difficult for the dairy processing firm to produce more sustainable products, and they may thus decide not to participate in sustainability transitions, even though there is a demand for more sustainable products among customers. And if the farmer eventually decides to invest in sustainable practices on-farm, this changes the constellation of forces, and may drive the incumbent dairy processing firm to participate in sustainability transitions.

5.2 Theoretical implications

The aim of this research was to provide an understanding of the drivers and barriers that influence incumbents' behaviour in sustainability transitions in the dairy processing industry in the Netherlands. By using Lewin's field theory, as proposed by Kump (2023), an understanding was obtained of the factors influencing incumbents' behaviour in sustainability transitions as

the constellation of forces in the field and conflicts between different forces that may impact incumbents' decisions could be defined. The findings offer insights into the dynamics and interactions between these forces and how they influence the behaviour of incumbents in sustainability transitions, thus contributing to the theoretical understanding of incumbents' behaviour in sustainability transitions.

Furthermore, this paper also serves as a practical example of how Lewin's field theory can be used to understand incumbents' behaviour in sustainability transitions by investigating the forces influencing their behaviour. By also serving as a practical example, the paper contributes to research in the field of sustainability transitions and understanding actors' agency in these transitions as it can encourage researchers in this field to also use Lewin's field theory to explain and understand incumbents' behaviour.

5.3 Practical implications

Contribution Besides the contributions of this paper to research in the field of sustainability transitions in the dairy (processing) industry, it also contributes to the practical field of sustainability transitions in the dairy (processing) industry in the Netherlands.

Since this research identified the constellation of forces at play, conflicts between forces and some situations in which the constellation of forces could change, other actors in the industry, such as policymakers or niche actors, can use this research to identify and define particular actions that would change the constellation of forces and drive incumbents into participating in sustainability transitions.

This paper also contributes to the recognition of the important role of incumbents in sustainability transitions in the industry by emphasising how different forces that drive incumbents' behaviour impact the (successful) facilitation of sustainability transitions. As this research helps other actors in the industry recognise the important role incumbents play in sustainability transitions, they can adapt their strategies such that they actively engage with incumbents and try to collaborate with incumbents in order to achieve successful sustainability transitions.

5.4 Limitations

Despite the valuable insights gained from conducting interviews with experts in the dairy processing industry in the Netherlands, this study also contains some limitations that may have influenced the outcomes of the study. First of all, one of the limitations of the research is the small sample size, consisting of 6 experts in the dairy processing industry in the Netherlands. Although the initial aim was to find 10 participants for the interviews, only 6 participants were found. The small sample size of 6 may not be completely representative of the whole population as possible variability in the population may not be captured. In addition, the small sample size also limits generalisability to a larger population, e.g. the entire dairy industry or the dairy processing industry in other countries.

Another limitation of the research is that one of the participants did not meet one of the sampling criteria. This participant was not employed by an incumbent dairy processing firm but worked at a branch organisation in the dairy industry. Although this participant was an expert in the dairy processing industry and provided valuable insights about the dairy industry and the forces at play in the industry, the participant could not provide first-hand knowledge from the perspective of a dairy processing company itself. This means that through only 5 interviews first-hand knowledge was gathered and therefore it is recommended that for future research, when also focusing on gathering first-hand knowledge, a larger sample size will be taken in order to ensure the reliability and generalisability of the research.

Lastly, a limitation of the research is that it solely focuses on the dairy processing industry in the Netherlands. Because of the focus on one country and one sector of the industry, the research is not fully generalisable to other countries and other sectors of the dairy industry, as forces and conditions may differ between countries and sectors. Future research could expand the scope of the study to more countries and sectors in the dairy industry to increase the generalisability of the study.

5.5 Recommendations

In this section, a few recommendations for future research on the topic of incumbents' role in sustainability transitions in the dairy industry will be given.

First of all, future research could investigate the strengths of different forces at play. By investigating the relative strengths of the different forces, and how strengths may vary over time, the importance of each force and the extent to which they influence incumbents' behaviour regarding sustainability transitions under different circumstances can be understood. This can help understand the dynamics of forces at play and to understand why incumbents decide whether to participate or not in sustainability transitions, given the different forces at play, their particular strengths and the specific circumstances at the time.

Future research could focus on forces at play for other incumbent actors in the dairy (processing) industry in the Netherlands, such as farmers or retailers. By focusing on other incumbent actors in the industry, a better understanding of the dynamics of sustainability transitions in the dairy (processing) industry in the Netherlands can be obtained. This can also enhance understanding of the roles different actors in the industry play in these transitions and the extent to which these actors are dependent on each other for their decisions whether to participate or not in sustainability transitions.

5.6 Conclusion

This paper aimed at identifying the forces at play in the decisions of incumbents in the dairy processing industry in the Netherlands whether to participate in sustainability transitions or not. Following the aim of the research, the central research question of this paper was:

"What are the forces at play among incumbents in the Dutch dairy processing industry in their decisions to participate in sustainability transitions?"

Through conducting interviews with experts in the field, the forces at play for incumbents in the dairy processing industry in the Netherlands to participate in sustainability transitions were identified. Following the identification of the different forces at play, a model was created that provided a clear overview of the several forces at play influencing incumbents' decisions to participate in sustainability transitions. Ultimately, the research provided new insights on the forces at play influencing incumbents' behaviour regarding sustainability in the Dutch dairy processing industry, which future research regarding incumbents' behaviour in sustainability transitions can build on.

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APPENDIX

Appendix A – Interview guide

Aim:

The aim of my research is to find out why incumbents in the dairy processing industry in the Netherlands do or do not participate in sustainability transitions. The objective of this interview is to find out which 'forces' are at play in the field. These forces can hold back change or push change.

Section 1: General questions about person/company

- 1.1. Can you tell something about yourself and your work? What is your position within [COMPANY]?
- 1.2. How long have you worked at [COMPANY]? Have you had other positions within [COMPANY]?
- 1.3. How long have you worked in the dairy (processing) industry? Have you also worked at other companies in the dairy industry?
- 1.4. Can you tell us something about [COMPANY]?
 - When was it established?
 - Something about the history of [COMPANY]?
 - Who are mainly its customers?
 - How many employees does [COMPANY] currently have, what are mainly the types of employees?

Section 2: Questions about personal motivations about sustainability

- 2.1. What does sustainability mean to you? How important is sustainability to you?
- 2.2. Do you feel a personal responsibility to promote sustainability in your role at [COMPANY]?

Section 3: General trends of sustainability in the industry

- 3.1. Are you following general developments on sustainable changes in the food industry, such as the European Green Deal or Farm to Fork Strategy, etc.? And what do these mean to your business?
- 3.2. Are you aware of any sustainability certifications or standards for dairy processing companies? If yes, which ones? And how do these relate to your business?
- 3.3. Are there any other kinds of changes (e.g., regulations) that currently affect sustainability in the food industry / dairy industry?

Section 4: Relevant forces at play within sustainability transitions

- 4.1. How important is sustainability for [COMPANY]?
- 4.2. You have already made changes towards sustainability. Can you describe them?
 - What was the trigger for these changes?
 - How did the ideas come about? Who brought that idea in?

- 4.3. And who are all involved when a dairy processing plant wants to become more sustainable? (Also externally?)
 - How do they influence decisions and operations?
- 4.4. What role do competitors play in your sustainability initiatives?
 - Do competitors' sustainability initiatives also influence your actions?
- 4.5. What was the role of employees in these changes?
- 4.6. What was the role of customers in these changes? Have you noticed any trends in consumer behaviour that suggested a growing interest in sustainable products / more sustainable practices?
 - What prevents customers potentially from buying more sustainable products?
- 4.7. Were there any contradictions/votes against it inside the organization? By whom? What were the arguments/reasons?
- 4.8. Were there other "forces" against the changes? What pressure was felt here? For example, from the side of the supervisory board, customers, NGOs?
- 4.9. Have you received any negative or positive feedback from customers, stakeholders, or other industry players regarding your sustainability practices?
 - If yes, what was the feedback and how did you respond to it? How did you deal with it?
- 4.10. If negative feedback, what motivated/encouraged [COMPANY] to implement the changes despite this backlash?
- 4.11. In implementing the change: what were the biggest challenges? How did you deal with them and what motivated you to continue?
- 4.12. When did you feel that the change had been successfully implemented and embedded in the company?
- 4.13. Are there any further forces that affect changes toward more sustainability in your business?

Section 5: General forces in the field

- 5.1. Who are the key players when it comes to becoming 'more sustainable' as a whole? I am thinking, for example, of interest groups, training institutes...
- 5.2. What are the drivers that make the entire dairy (processing) industry more sustainable?
- 5.3. What are the barriers that stand in the way of making the entire dairy (processing) industry more sustainable?
- 5.4. How can collaboration between different stakeholders in the dairy (processing) industry (e.g., suppliers, consumers) help to overcome forces working against sustainability?
- 5.5. What would be needed to make a larger number of companies more sustainable?
- 5.6. Are there any economic or financial factors that make it difficult for companies to become more sustainable? If yes, please describe.
- 5.7. What initiatives/funding would be useful?

- 5.8. Is there currently enough supply of green products and how could this supply be increased?
- 5.9. If you were a politician, what would you change?

Section 6: Force conflicts

- 6.1. Are there currently conflicts or dilemmas or have you had conflicts or dilemmas when implementing more sustainable practices because of the various driving or counteracting factors involved in making the dairy industry more sustainable? If yes, between which factors? (E.g. between factors to make more sustainable versus factors not to make more sustainable).
- 6.2. What are the effects of these conflicts?
- 6.3. Did the conflict affect your behaviour or decision-making process? If yes, how?
- 6.4. How can these conflicts be reduced?
- 6.5. What has [COMPANY] done to reduce these conflicts/dilemmas?

Section 7: Questions to end with

- 7.1. Are there any factors currently holding [COMPANY] back / working against it with regard to sustainability at the moment?
- 7.2. What are [COMPANY's] future plans with regard to sustainability?
- 7.3. Did I forget to ask something, or do you want to add something?

Appendix B – Matrix of the forces at play in incumbents’ decisions to participate in sustainability transitions in the dairy processing industry in the Netherlands

