

# **Transitions in the making: the Dutch case**

*Dutch business and the drive for sustainability*

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Nowadays almost every company is confronted with the challenges of the new sustainability standards. Be it governments or consumers, a more ecological production is expected either by the market or by rules and regulations. In the recent past companies proved to be able to adapt themselves towards a more environmental friendly strategy and responding to societal issues. A transition towards a more sustainable and inclusive society however takes more effort. It implies abandoning familiar paths and embracing new values and rules. In this paper we will distinguish and explore different paths of change and adaption towards a new set of rules to make businesses more sustainable and inclusive. These may range from portfolio-modifications to actions in the context of corporate social responsibility and even the introduction of a completely different company profile. We will explore the ways a selection of Dutch companies tried to meet the challenges of a more sustainable and inclusive environment. Which companies were in the forefront and which were followers?

The first section of this paper provides a brief overview of the theoretical premises of this paper and introduces Deep Transition theory as a starting point. The main focus is on the existence of meta-rules that guide the way business functions. These meta-rules emerged and evolved as a result of the Industrial Revolution in a process referred to as the First Deep Transition. In the second section an inventory is made of strategic principles and actions of companies that tried to formulate a response to the challenges posed by the ecological and social crises.

### *Theoretical notions*

Two centuries of industrialization have shaped our current society based on mass consumption, mechanization, large-scale use of fossil fuels, and resources, thought to be inexhaustible. These classical principles are in the 'genes' of our institutions and form the backbone of socio-technical systems like mobility, food, housing and energy supply. They have led to prosperity and well-being in the past, but are now blocking a new and indispensable transition towards a sustainable and inclusive society. There is great unanimity to achieve this transition and ambitious programs are now being developed more than before. In all kinds of academic en non-academic fields, new visions are formulated for climate and energy, food and agriculture, mobility and infrastructure, circular economy and the use of raw materials.

This paper takes the Deep Transition model of Schot and Kanger as a theoretical starting point to explore business strategies in different socio-technical systems (Schot and Kanger 2018; Kanger and Schot 2019). This model brings together insights of different theoretical strands, ranging from Technology and Innovation Studies, institutional theory and evolutionary theory (Schot & Kanger 2018). In the Deep Transition model socio-technical systems are central. These configurations of actors, technologies and institutions are defined in time and place. It is important to make clear that the concept of socio-technical systems should not be confused with sectors or industries. ST-systems consist of a cluster of aligned elements such as producers and their supply networks, chain-linkages, user practices and markets, regulation and cultural meaning, to fulfill societal functions like housing, energy, food, transport or health (Geels 2004). The systems are considered to be an expression of rules that determine the development of the system and ultimately also the evolutionary direction of society. To transform society new rules should be developed in multiple systems. A deep transition is therefore a 'process whereby rules emerge, diffuse and become aligned, thereby providing single systems and interconnected complexes of systems with a specific long-lasting set of directions' (Kanger & Schot 2018). This is more than technological development, it also involves institutional and social change. Technology alone does not drive the changes in socio-technical systems. People and institutions influence the way how technologies emerge and are adapted. They shape technology and dictate which innovations will succeed, which ones will fail and which will ultimately drive change towards a new socio-technical landscape (Lintsen 1992-1995; 1998-2002).

The basic idea is that Deep Transitions require a fundamental change of rules that govern socio-technical systems. Rules are a key concept in the Deep Transition framework

and have come about through a long process of path dependency. Deep Transition is about how rules emerge, come to be aligned to each other and diffuse to various systems. These rules are not just technologies or laws and regulations, but relate to societal rules that are an emanation of routines, values, expectations, and mindsets. Important meta-rules are: mass-production that developed as a feature of the Industrial Revolution, or the use of fossil energy necessary for steam engines (coal) first and later for motor-traction (petrol) and generating electricity (natural gas). But also linear production, using mineral and other resources, and globalization can be seen as meta-rules typical of the First Deep Transition. These rules have driven innovations and system evolution into particular directions for the past 250 years. The nexus of rules makes up a regime with ‘semi-coherent rule sets directing the behavior of a set of actors in multiple socio-technical systems’ and has a universality across different societies all over the world (Schot & Kanger 2018, Kanger & Sillak 2020; Schot 2021). Table 1 summarizes the main concepts in DT theory.

Table 1: rules and regimes

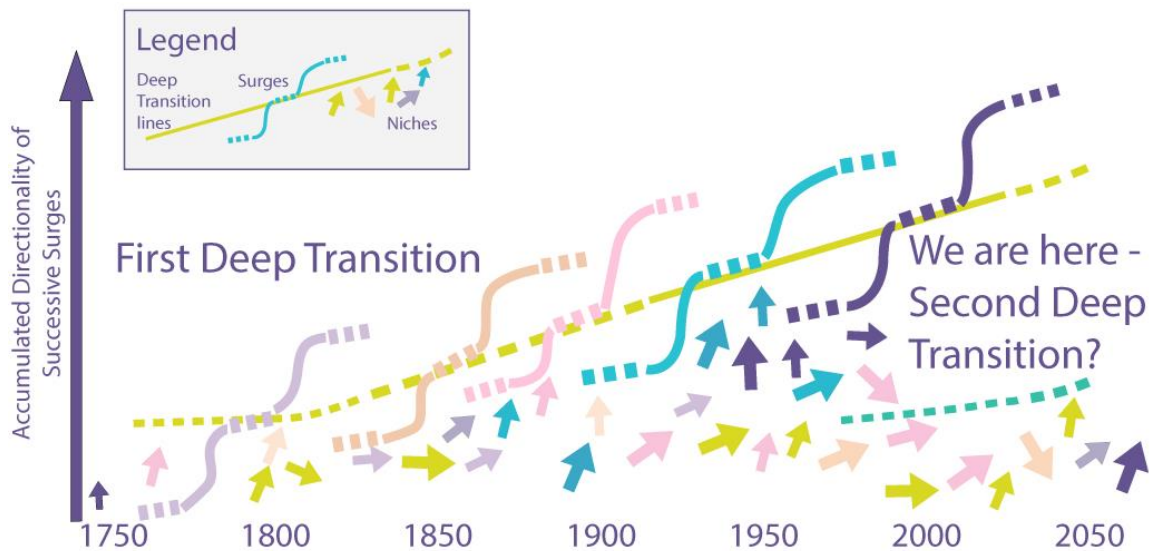
Concept	Definition
Socio-technical systems	Configuration of actors, technologies and institutions for fulfilling a certain societal function
Meta-rules	Rules which are shared among multiple socio-technical systems
Regime	Semi-coherent rule-sets directing the behavior of a set of actors in multiple socio-technical systems
Meta-regime	Semi-coherent rule-sets directing the behavior of a set of actors in multiple socio-technical systems
Landscape	A set of macro-structures and dynamics
Deep Transition	Series of connected and sustained fundamental transformations of a wide range of socio-technical systems in a similar direction

Source: Kanger & Schot 2018; Kanger & Schot 2019

According to the Deep Transition model the meta-rules that shaped the socio-technical landscape of today, have to be adjusted to realize a more sustainable and inclusive world. The key question of the Deep Transition model is: how do these transitions take place, how do the

meta-rules change and can we already observe some of these changes. According to Schot and Kanger niches play a crucial role in the transition of societies and transformation of single socio-technical systems. Niches are synonym to alternative innovations that compete with the established configuration of socio-technical systems (the regime). They emerge and open windows of opportunity for change when regimes are destabilized by external shocks or crises. Niches can be initiated by different actors, ranging from individual firms and investors to governments and international institutions (Schot & Kanger 2018). The timing of the process and more specifically the potential of a radical innovation – both technological and institutional - to succeed, to change the rules and diffuse to other socio-technical systems, can be discussed. Thus niches have the potential to radically change not only the socio-technical system, but also the underlying meta-rules. In this respect, the DT paradigm differs from most other transition models that see opportunities in optimizing existing systems to achieve the intended sustainability and inclusiveness (Geels 2022).

Elaborating on the Multi-Level Perspective literature and the Techno-Economic Paradigm, the Deep Transitions Theory designed a multi-level model of five surges (Grin 2010; Perez 2002. Kanger & Schot 2018). The idea is that new rules occur in many niches, initially transforming single systems and subsequently spreading across multiple systems. A paradigm shift, which involves both technological change and a change in institutional and economic structures, occurs when existing technologies and structures are challenged by alternatives that are embraced and explored by entrepreneurs or financial actors. The evolution of this process along different stages is well described in theory (Schot & Kanger 2018) and in case-studies on mass production (Kanger, Rotolo, Bone & Schot, 2021, Kanger & Sillak 2020).



Source: Schot & Kanger 2018

### *The ability to change*

According to the Deep Transitions theory 'a struggle' takes place within socio-technical systems between the rules of the dominant system, the 'regimes', and emerging alternatives 'niches' (Schot and Kanger 2019). Breaking existing regimes and changing the patterns within historically grown systems is anything but easy because meta-rules such as mass production, linear production, globalization and the use of fossil fuels, are hard to change. These meta-rules are under discussion nowadays, but changes entail risks, cause uncertainty, and will inevitably create tensions. Some companies are in a favorable position to adapt to the new rules, others for example the steel industry or the oil-industry itself will have more difficulty to adjust to new circumstances or will even become completely obsolete.

Under what circumstances and conditions can transition be achieved and to what extent are companies able to align to new meta-rules? In this section examples of companies that changed their focal point and contributed to societal transition will be discussed. A number of companies underwent a true metamorphosis, others adjusted their portfolio or introduced new rules, and still others tried to make a positive contribution as part of a CSR policy. We will give a few examples from each of these three categories, realizing that this is certainly not a representative sample of the Dutch business community.

A first category concerns companies that have completely changed over the course of the 20th and 21st centuries. A clear example is the Centrale Suiker Maatschappij (CSM). Founded in 1919, this private sugar company expanded in the 20th century to become the largest sugar producer in the Netherlands. Apart from increasing the scale of sugar production, particularly from the 1960s onwards CSM strove to broaden its portfolio. Diversification was key in this period of declining economic growth and was embraced by many companies. This led to a remarkable conglomerate merger wave. CSM by acquiring other companies, transformed into a food company that produced all kinds of lactic acid applications for the chemical and pharmaceutical industries (Sluyterman 1995). Sugar production became less and less important and in 2006 CSM even sold its sugar division to its main competitor Cosun. In the 21st century, the company internationalized, specializing entirely in biological products, including bio-plastics. In this way small business units grew into the core business. This process was of course mainly driven by the search for new more profitable markets, but a positive side-effect was a gradual shift from linear to circular production and fossil fuels being replaced by non-fossil energy. The former sugar manufacturer, since 2013 operating under the name Corbion, thus entered new markets and became part of other socio-technical systems with new rules.

Another example of a Dutch company that has made a fundamental transition is former Dutch State Mines (DSM). Founded in 1902 as a state company for the exploitation of the coalmines in the southern part of the Netherlands, the company initially only produced coal and sold by-products from the gasification of coal. But after WWII it grew into a chemical concern and apart from coal and its by-products DSM now became an important producer of fertilizers that were much in demand for the developing Dutch agricultural sector (Homburg, 2004). The continuous search for new products and processes, often in DSM's own research laboratories, was an important driver of the company's success. This became especially clear after the last Dutch coal mines were closed in the 1960s and the company had to look for a new future. Bulk chemistry, of which the production fertilizers was an early example, offered a solution. The company shifted its focus to petrochemicals and the production of plastics.

But the market for bulk chemicals matured and became less profitable. So in the last quarter of the 20th century and the beginning of the 21st, the company again changed its focus. This time DSM developed into fine chemicals and pharmaceuticals that offered a higher added value. Conquering a market share was not a major obstacle because this transition took place mainly through acquisitions while at the same time divesting bulk

chemicals. After the turn of the century DSM further developed into a multinational company specializing in nutrition, health products and specialty materials. This transition was not only motivated by a search for profitability, but the company explicitly focused on sustainability and the use of renewable energy (Van Rooij 2007).

Both CSM and DSM completely transformed over time, becoming active in other socio-technical systems that each had their own rules. In both cases, this transformation came 'from within' and took place organically, as it were, using strategic judgments to enter new markets. The transformation of both companies did not immediately lead to shifting attitudes towards all the rules. Whereas the use of fossil fuels and linear production were critically reviewed, meta-rules such as globalization and mass production still seemed to be gaining traction in both listed companies.

These examples of large companies that made a transformation by changing their markets and activities, are exceptional. In most cases, the firms continued to operate in the same market or within the same socio-technical system. But already from the 1970s onwards conditions changed and these companies to lesser or higher degree also had to adjust their activities to the new circumstances. To this end they made strategic choices within the socio-technical systems in which they operated and in some cases this brought them into contact with new rules or enabled them to reformulate the rules themselves.

However companies overall tended to resist adaptation to growing regulatory demands and public pressures. Because of the economic recession in the 1970s and 1980s opportunities for change were limited. As a result the initiatives were often defensive in nature and can be linked to imminent changes in the meta-rules. The Dutch paper and cardboard industry is a good example of this defensive strategy. In the 1970s it realized that the industry's competitive position was under pressure, particularly because of the relatively high environmental costs per ton of paper. Initially the industry reacted quite traditionally, scaling up production and concentration in larger units. However, it turned out that this policy, followed by most competitors around the world, only deepened the crisis.

Ultimately the paper- and board-industry responded to trends that should lead to more sustainable business. In cooperation with the Dutch government and making use of fiscal and legal opportunities, research institutions and interest groups became central. The sector concluded covenants to reduce the use of energy and water. Research on recycling, the processing of residual flows and also energy-saving projects and the use of alternative raw materials led to interesting results (Bouwens, 2004). The industry embarked on a course that

involved recycling more waste paper and board and making less use of imported (wood) pulp. Both large companies and small players started experimenting with new raw materials and product applications, just as they had done in the 17th century (Ehrich 2021). Numerous companies and industries have made similar adjustments in recent decades. Thus new rules, customer based and tailor made production, recycling and cooperation in strategic alliances, were ingredients for a gradual change in the case of this industry.

Societal pressure and also environmental restrictions stimulated companies to react and in some cases even pro-actively change their strategy. A good example of this is the well-known Dutch brewer Heineken, founded in 1864 and still to a large extent a family-controlled business. Though beer is a natural product consisting of water, barley (or other grains), hops and yeast, Heineken was already in an early stage confronted with environmental issues. Water pollution and the traffic congestion in the inner city motivated Heineken to move its breweries outside the cities of Amsterdam in the 19<sup>th</sup> century and Rotterdam in the 1960s. Because clean water is essential for brewing beer, water pollution was taken serious by Heineken when this became an international issue in the 1960s. Heineken put a lot of effort in developing new techniques for water-treatment and it claimed that ultimately their waste water was more clean than the canal that it was discharged to. After the turn of the century Heineken expanded its clean water treatment to all its breweries worldwide. The treatment installations were improved in such a way that the resulting biogas offered a supply of clean energy (Sluyterman and Bouwens 2014).

Innovation also played a significant role in Heineken's ongoing battle to save energy that had started already in the 1970s. Heineken together with Royal Dutch Shell constructed a combined heat and power generating plant that saved on the energy bill substantially. Dutch government also expected Dutch brewers to contribute to the saving of energy. They collectively agreed on a covenant in 1992 to reduce the use of energy with about 20 per cent. Apparently energy saving was very profitable because in 2001 it turned out that the Dutch brewers had reduced the use of energy by nearly 30 per cent. (Sluyterman, 2023). Heineken focused on a sustainable image especially after 2000 and initiated numerous activities to contribute to this. The local brewing of beer using local raw materials and labor was a powerful example. Partly enforced by local governments and the different local institutional conditions, facilities and tastes, the globally operating group with a "world brand" also focused on regional production. It shows that the somewhat ambiguous meta-rule globalization can also have another face.



There is much debate in academia (and beyond) on the significance of corporate social responsibility (CSR) for the transition to a sustainable and inclusive society. The motivations behind corporate CSR policy choices are sometimes dubious (Laasch, Freeman et al. 2020). However, in transition theory, these policies can be viewed as 'changes in the landscape', that is societal pressures that lead to a new configuration of systems. CSR is the response of firms to these pressures. As such, the phenomenon has deep roots and has many different manifestations (Sluyterman, 2012). From the 1990s onwards, more companies were focusing on sustainability aspects in their CSR-policy. It is striking that niches did not always play an important role in this. Technological developments were usually of secondary importance to the organizational - new practices - interpretation of sustainable solutions.

Companies are responding to society's demand for sustainability and inclusiveness in different ways. Producers of electric cars, vegetarian meat substitutes or regional products are clear examples of a Second Deep Transition, in which the traditional meta-rules are replaced by more sustainable alternatives. But also within existing companies transition is taking place. Sometimes by a complete shift in markets and activities, but in many cases companies try to adjust their activities to fit into new rules that support sustainability. The examples show that there are different ways to contribute to a sustainable future, but that the balance between private interests, consumer preferences, societal demands and technical possibilities is a precarious one.

## ***Conclusion***

To understand the current crisis it is essential to look at its historical roots. The Deep Transition model offers a perspective on the way modern society developed and on the underlying forces, the meta-rules that shaped everyday life. History is important and the Deep Transition model can link past and present, but also offers a glance at the future. But companies are not aware they are part of a Deep Transition. They develop their strategies and explore markets according to the opportunities they find. These opportunities are defined by external conditions. So when conditions change, companies will have to react and in this way new techniques and new practices evolve.

The examples given above illustrate how the companies that were shaped by the meta-rules of the First Deep Transition responded to the changing demands and ambitions that resulted from the sustainability goals. The possibilities of 'renewable' non-fossil fuels were explored and the demands for small scale, local production were met to some extent. Under

changing circumstances some companies looked for new products that better fitted with new demands and became part of a completely new socio-technical system. Most companies however remained part of the same socio-technical system and adjusted to new conditions by applying new techniques that are more in line with the demand for saving energy or reducing waste. Other companies used innovations and adjusted their strategies to contribute to changes. They aligned with local conditions and global demands and ultimately this new approach can result in new meta-rules.

It is clear that the regime players (large corporations) will continue to have an important role in the Second Deep Transition. The question however is to what extent they will succeed in changing or combining the existing meta-rules into a hybrid constellation. The context of entrepreneurship - strategy as fashion, cyclical developments, the political-economic and institutional context, social debates - is conditional to the creation of new rules. Niches play an important role in the creation of new meta-rules, but it is often traditional business or big companies that create conditions for innovation. In the examples mentioned above, changes usually came about incrementally and niches only formed part of this. To a large extent the socio-technical systems as they were defined in the First Deep Transition were optimized and did not really adapt to meet the challenges of the new sustainability standards that are part of the Second Deep Transition.

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