

Business Strategies for Transitions towards Sustainable Systems

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Business strategies for transitions towards sustainable systems¹

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Abstract

This paper develops a strategic perspective for business to address persistent sustainability issues by contributing to the innovation of societal systems. Sustainability issues at the level of societal sectors or domains cannot be addressed by single organizations but require co-evolutionary changes in technology, economy, culture and organizational forms. We present the case of transition management in the Netherlands – an approach combining systems analysis with new modes of governance to influence the direction and speed of structural changes towards sustainability – and the activities of two firms working in this new context. From the two specific cases we conceptualize business strategies at different levels to advance sustainable development.

Keywords: sustainability, business development, transition management, systems

Introduction

This paper presents a strategic perspective for business to address persistent sustainability issues by contributing to the innovation of societal systems. In the past few decades, societal demands on companies to address social and environmental problems have increased significantly (Margolis & Walsh, 2003). Accordingly, companies engaged in corporate social responsibility (CSR) and environmental management must deal with diverse stakeholder expectations. To date, the academic literature has largely focused on business performance and sustainability at the firm or industry level (Bansal & Gao, 2006, Jermier et al, 2006, King & Lenox, 2000). However “firms alone cannot become sustainable in an economic, environmental and social sense as they merely contribute to more sustainable patterns of production and consumption within society” (Roome, 2006: 137). Despite the growing awareness of the systemic nature of our sustainability problems, empirical research that examines the strategic practices of business to structurally change the way societal systems operate *in order to address persistent environmental and social problems* is not well developed (Porter, 2006, Shrivastava, 1995, Starik & Marcus, 2000).

Concurrently, the problems facing our society are becoming more complex and are often persistent in nature. Examples of persistent unsustainability in developed countries are: climate change at a global level; the agricultural problem at continental scale, with animal diseases as symptoms (such as bird flu, mad cow disease and foot-and-mouth disease) and the problems of increased mobility at a national level with traffic congestion and air pollution as symptoms (Rotmans & Loorbach, 2007). Persistent problems are complex, as they are deeply embedded in societal structures and institutions. They have multiple causes and consequences and their reach stretches beyond a wide range of societal domains, actors and scale levels. These factors make such problems difficult to manage and hard to grasp (Dirven et al, 2002). Persistent problems, such as the unsustainability of our current energy system, are unlikely to be solved by contemporary government policies, individual firms or innovations. Instead, Rotmans et al (2000) argue they require a structural change of the system in terms of technology, economy, culture,

ecology and institutions and organization: a transition. A transition is defined as a long term process – it may take one or more generations – of non-linear social change leading to new constellations of actors, structures and practices which determine the functioning of the system (De Haan, 2007).

The complexity and persistent nature of sustainability issues pose new challenges on business, which requires new conceptual models for researching the relation between organizations and the natural environment. Next to stressing the importance of coevolutionary logic that assumes the firm has a symbiotic, coevolving relationship with society and ecosystems, Porter proposes that coevolutionary mechanisms provide organizational researchers and managers with a perspective that links firm level activities to the societal level effects in an iterative process (Porter, 2006). Applications of coevolutionary frameworks are emerging in research on clusters of innovation for sustainability (Boons & Roome, 2005) inter-organizational collaboration (Gray, 1989, Svendsen & Laberge, 2005, Westley & Vredenburg, 1997), and learning-action networks (Clarke & Roome, 1999). Important aspects of systemic change that are highlighted in the few empirical studies on this are collaboration and network forming around system level goals (Fourie & Eloff, 2005, Westley & Vredenburg, 1997), involving business, NGO's, government and communities concurrently (Fourie & Eloff, 2005, Wheeler et al, 2005), personal leadership (Fourie & Eloff, 2005, Westley & Vredenburg, 1997) and changing mental models to see interdependencies (Senge et al, 2007, Wheeler et al, 2005). The coevolution between business activities and changing societal systems, and the opportunities and challenges this creates for business in strategically addressing sustainability issues has not yet been empirically examined.

This is an important gap in the literature that our paper hopes to address. We present two empirical examples of a systemic approach to dealing with sustainability problems from the Netherlands. Within the Dutch context, these cases are part of a larger government initiative to experiment with Transition Management - a combined conceptual and applied approach for researching and implementing structural changes at the societal level and concretely influencing transitions towards sustainability (Rotmans et al, 2000). We examine the strategic role of the firm within such transitions.

The paper includes five sections. The first section reviews the literature on individual and collaborative sustainability approaches of firms and introduces transition concepts. The second section illustrates how two companies, that operate in a context where transition management is applied, take a different approach to sustainability issues. In the fourth section we discuss our findings and present a framework for conceptualizing business strategies for transitions towards sustainable systems. The paper concludes by indicating implications for further research.

Theory

In a broad sense the literature on sustainability aims to provide better understanding of the relationship between business and the environment. Looking more

closely, existing literature can be characterized as firm or industry level focused (Bansal & Gao 2006; Jermier et al 2006). Research on organizations and the natural environment (ONE) has grown dramatically over the years (Bansal & Gao, 2006). The majority of studies in this field attempt to measure or explain environmental performances of organizations, e.g. in terms of waste production or resource use, adoption of ISO 14001 or how regulation influences performance (Bansal & Gao, 2006; Jermier et al. 2006). But persistent sustainability issues – such as climate change or mobility problems – require more radical and structural changes within and between organizations (Rotmans, 2005), for which reduction of environmental impact by individual firms does not suffice. While we now know a great deal about how firms and industries respond to environmental pressures, we know less about how the micro behavior of individual actors (Bansal & Gao 2006) contributes or detracts from sustainability. Nor do we know much about how individuals, firms, or industries operate at the macro or systems level.

Although Starik and Rands (1995) provided a framework to study the relationship between the organization and other levels of analysis (political-economic, social-cultural, ecological and individual), interactions between different levels are hardly investigated (Bansal & Gao, 2006). Social issues of sustainable development (Starik & Marcus, 2000), (power) relationships and interdependencies between organizations in larger societal systems are under addressed within ONE research. While corporate environmentalism has developed from reactive responses in the early years to more proactive business strategies currently (see e.g. Carroll, 1999, Hoffman, 1997; Jermier et al 2006), firms still focus more on *reducing* unsustainable firm-level behavior than on increasing the sustainability of the system via radical change across actors and levels (Ehrenfeld, 2005).

More recently, researchers have proposed that we should focus more on interdependencies between business and society and take collaborative approaches to create systems change (Boons & Roome, 2005, Porter, 2006, Svendsen & Laberge, 2005). From the assumption that sustainability issues are too complex and interconnected to be solved by individual firms, several researchers have developed network and systems approaches to sustainability issues (Boons & Roome, 2005, Svendsen & Laberge, 2005, Westley & Vredenburg, 1997, Wheeler et al, 2005). Most of these studies accordingly use the network as the unit of analysis instead of the individual firm. Sustainability activities of firms are conceptualized as corporate engagement in collaborative efforts with multiple stakeholders to address social issues (Svendsen & Laberge, 2006). Svendsen & Laberge (2006) argue that stakeholder networks can tap co-creative power: the capacity of the network to self-organize, find novel solutions and adapt to environmental changes. Firms, in collaboration with other stakeholders, create learning-action networks (Clarke & Roome, 1999, Westley, 1995) and develop new capabilities within clusters of innovation with respect to sustainability, at the level of a product, sustainable technology, industry sector or geographic area (Boons & Roome, 2005).

This body of literature provides us understanding on conditions and new management models for multi-party collaboration and networks, illustrated by some empirical evidence. From a business perspective, it is argued that an issue is (most) salient to address if a firm cannot deal with the issue on its own because of its complexity

(Svendsen & Laberge, 2006) or when addressing the issue either relieves significant negative impacts on society or provides chances to improve the competitive environment (Porter & Kramer, 2006). To create a common understanding on the issue and its causes, it is important to involve relevant stakeholders and share information (Gray, 1989, Svendsen & Laberge, 2006). Other conditions for multi-stakeholder processes include defining the goals of the network, clarify roles and responsibilities, agreeing on shared rules and norms and collective learning (Gray, 1989). Collective learning is essential for system innovation as it helps developing knowledge about root causes, linkages and patterns, construct shared meanings and to clarify common ground and differences in perspectives, interest and needs (Svendsen & Laberge, 2005). Firms need to have an appropriate culture for this, with collaborative capabilities and values like being open and responsive to multiple perspectives, building networks and develop mutual understanding (Boons & Roome, 2005, Clarke & Roome, 1999, Wheeler et al, 2003). Through interaction, people build trust and commitment (Ring & Van de Ven, 1994), which is essential for effective collaborative action.

Although this literature gives insight in collaboration processes and required capabilities of firms, it hardly takes into account the larger context in which this takes place. With context we mean the dynamics of the larger societal system: the actors involved in a certain domain, (power) relations (Hardy & Clegg, 2006) between them and dominant practices and mindsets. As a result, the complexity and persistent nature of many sustainability issues seems to be largely underestimated. Through research on coevolutionary mechanisms (Lewin & Volberda, 1999), which draws from evolutionary and complexity theory, scholars can create better understanding of co-evolution between firms and societal and ecological systems and between peoples values systems and technical solutions (Porter, 2006). While appealing at the conceptual level, there are few, if any, empirical studies examining a co-evolutionary approach to sustainability.

The co-evolutionary perspective is also a central element in the research on societal transitions. Rotmans et al (2000) argue that, from a sustainable development perspective, transitions are necessary to deal with persistent problems and unsustainable social systems such as mobility, agriculture, energy, education and health-care. A transition – a structural change in a societal system – emerges out of co-evolutionary processes in which institutional, technological, behavioral, ecological, economic and other processes intertwine and interrelate, and consists of a number of system innovations. System innovations are defined as “organization-transcending innovations that drastically alter the relationships between companies, organizations and individuals involved in the system”, such as an economic sector, societal domain or region (Rotmans, 2005: 11). Furthermore, to direct transitions towards sustainability, new modes of governance are needed that take into account the long time-horizon, the uncertainties and complexities and the multitude of actors and interests involved. For instance, Loorbach (2007) also points to the importance of bringing together stakeholders to understand root causes of persistent complex problems. He argues, however, unlike much of the previous literature on collaboration, that this should be a small group of front-runners, who are able to reframe problems into attractive sustainability visions, instead of representatives of all organizations involved in an issue. Complexity governance means creating institutional,

mental and financial room for innovation, emergence and (self-) organization. In other words, space for building up alternative regimes.

Two main concepts are used to describe and analyze transitions. The multi-level concept describes the dynamics of a transition as the interactions between different scale levels (Rotmans et al, 2000): the meso-level at which a regime of dominant structures, culture and practices operates, a micro-level of niches, innovations and alternatives to the regime and a macro-level of societal trends and developments. The multi-stage concept is used to describe the different phases of transition: predevelopment (tension is building on a vested regime but not much seems to happen), take-off (multiple developments interlock and cause a sudden chaotic period), acceleration (change is quickly materializing and leading to radically new structures) and stabilization (the process of change slows down and result in a new but fundamentally different dynamic equilibrium). The multi-level and multi-phase concepts combined enable an analysis of causes and drivers for transitions and an assessment of the state of a societal system. Once patterns and mechanisms in a system are identified opportunities for influencing arise. The transition management approach attempts to influence a loosely coupled set of multi-level organizational actors towards a transition into a more sustainable system.

To date, organizational research has not examined business strategies during such transitions. In order to address this gap in the literature, we present the case of transition management governance in the Netherlands and illustrate how Dutch companies take advantage of the dynamics of their societal context.

Case example: transitions and transition management in the Netherlands

During the last seven years, Dutch researchers have been developing an approach to influence and guide transitions towards sustainability: transition management. Next to theoretical insights from complexity theory, sociological and governance theories, the transition management approach is derived from practical experience with the initial guidelines and models of transition management. This interaction between theoretical development and practical application became possible as the Dutch government adopted transition management as official policy to deal with persistent problems in 2001 (VROM, 2001). After shortly describing how the current transition management approach has been developed and what its main elements are, we illustrate how two firms developed strategies to drive transitions towards sustainable systems forward.

Development of the transition management approach

Transition Management (TM) starts with the concept that society is a patchwork of complex adaptive systems. “The basic steering philosophy underlying TM is that of anticipation and adaptation, starting from a macro-vision on sustainability, building upon (micro) initiatives, meanwhile influencing the meso-regime” (Loorbach, 2007: 82). In this approach, complexity and uncertainty are not seen as problems, but as driving forces of societal change and as levers for governance. Transition management takes a process

approach that aims to change the dominant culture, structures and practices of unsustainable systems by linking innovations at the micro level to macro level changes in mindsets. This requires different roles and practices from individual actors involved, such as companies, scientific institutes, governmental organizations or NGO's. In practice three different types of activities and new roles were distinguished and conceptualized as the strategic, tactical and operational level of transition management, from a governance point of view (Loorbach, 2007).

At the *strategic* level transition management activities seek to develop a shared understanding of reality (structure the complex problem(s) at hand and find root causes of the problem by sharing and converging divers problem perceptions) and a sustainability vision amongst a relatively small innovation network of forerunners (a transition arena). Joint insights and long-term ambitions and goals are formulated that act as cognitive frames for individual action. The strategic level thus requires strategic thinkers that are open to change and reflection.

At the *tactical* level transition management aims to gain societal support and attention for sustainability objectives and intermediary goals at the level of subsystems by developing support networks and coalitions around transition pathways. The main challenge here is to identify and overcome structural barriers – such as regulations, market conditions, technologies and consumer routines – to development in the desired direction.

At the *operational* the primary goal is to experiment with, develop and learn about the potential of various innovations – such as new technologies, practices, products or organization – and their contribution to the overall transition. This means developing portfolios of experiments and innovations (technological, institutional, behavioral, organizational etc.) that have potential to materialize the strategic vision and develop into new, more sustainable practices and structures. Transition experiments inform actors about specific barriers for implementation in different environments.

On the area of sustainable energy the Ministry of Economic Affairs has developed an experimental and innovative process in which all sorts of actors are involved at different levels around a shared transition vision and agenda (EZ, 2004). They developed a number of transition arenas, small networks of selected frontrunners with different backgrounds that go through a process of co-developing a vision, transition agenda and experiments. The transition arenas around themes such as Green Resources, New Gas, and Energy and the Built environment laid the foundations for the development of communities of innovative actors that co-produce, implement and evaluate strategies and experiments. A large number of experiments – technological as well as organizational – have been funded and increasing political and public attention is drawn to the energy transition process. In this new context of governance in which self-organization and experimentation is stimulated and facilitated, new initiatives from individual firms have room to mature and become adapted on a wider scale. In practice, these experiments have demonstrated that an essential condition for transition management is to have common insight in how the system works (Loorbach 2007). That is, what are dominant practices,

technologies and ways of thinking, what (power) relations can be recognized, what types of regulations or other incentives influence behavior of actors?

While the transition management approach basically is a new governance approach at a societal level, we propose that the approach can also support individual firms in concurrently developing their own business and contributing to transitions towards sustainable systems. We illustrate this by describing how two Dutch firms take advantage of the new governance context that is emerging in the Netherlands related to sustainable development. These illustrations are based on interviews, participant-observation and document analysis over the last three years and provide us with empirical data on how firms deal with persistent sustainability issues strategically in a changing environment.

ESHA Group transitioning roofs

An example of how a firm might use transition management to create new business opportunities, to improve its image and contribute to societal innovation and sustainability is the ESHA Group², part of the Icopal Group, and producer and manufacturer of bituminous products. Bitumen is a by-product of the oil industry and is used for roofs (the black tar-like roof coating). Traditionally, bitumen roofs have no other function than as a cover for buildings, but over the past few years ESHA has begun to take advantage of a technological innovation that allows roofs to also provide important urban ecological functions. ESHA has actively developed innovative and sustainable solutions for roofs such as green roofs that can buffer water or contribute to cleaner air. Recently, the CEO of ESHA has started up a new strategy to broaden the activities of ESHA and the context in which their activities take place.

This CEO, an idealistic and innovative entrepreneur, developed the Earth Recovery Open Platform (EROP), a dialogue with innovative individuals representing different aspects of the field (for example, construction companies, designers, urban planners, policy makers, water managers, energy companies). Within this transition arena, these actors discuss and debated new options and how they, as a sector, could contribute to and accelerate the change towards a more sustainable society. The innovative 'reframing' of roofs as functional areas that need to be developed to contribute to societal development and urban ecology is an intriguing illustration of a shift towards a more systemic mindset focused on broader sustainability issues. To this end he and his team within ESHA consisting of technology developers, marketers, policy experts and newly hired staff such as a toxologist, came up with the idea of roof-transition. At a strategic level, they developed a new paradigm and vision related to roofs. No longer should roofs only be regarded as roofs: the current 350 million m² of traditional roofs should be transformed into roofs that contribute to sustainability in society. An applied research study commissioned by ESHA calculated that the reduction in CO₂ emission of replacing one m² of traditional roof by a sustainable solution equals the CO₂ emissions of driving one kilometer by car. The ESHA message subsequently was that from now on all roofs in the Netherlands should be gradually transformed to achieve a substantial contribution to reducing climate change and promote of sustainable energy and efficiency. This would

² See: www.eshanl.nl or for their transition initiative: www.zwart-gras.nl (in Dutch)

require a sector-wide structural change in thinking, structure and practice. At the tactical level, they subsequently developed different ambitious images of roofs producing energy, buffering water, cleaning air, storing heat, and cooling buildings. Operationally, they are now in a process of co-developing experiments to implement these concepts. Also, ESHA built the first 100% bitumen-recycling plant and develops CO₂-extensive new roofing equipment. These projects are explicitly linked to a variety of persistent societal problems in the Netherlands (such as water problems, energy dependency, poor air quality in cities, safety issues in public buildings).

ESHA chose to start with an open dialogue and discuss this approach and these ideas with all sorts of actors: environmental NGO's, social scientists and governmental organizations. In this dialogue the aim is to create broad awareness of the possibilities and create a broad societal innovation process in which obviously ESHA could also extend its own business. According to ESHA, such an approach is necessary because such a transition of societal importance should be a shared responsibility and ambition of the whole sector. Secondly, to be able to succeed a multitude of innovations is necessary: new rules and regulation, new technologies, new design and manufacturing tools and practices, new financial schemes and so on. By creating a broad multi-party network and investing in a shared agenda for social change, a movement in this way started that in time will benefit the company.

Immediately, the tensions as well as the innovative potential associated with transition processes came to the fore. While in general the various sector actors supported the transition towards full use of all bitumen roofs to help solve the problem of CO₂ emissions, there was fierce competition over specific technologies, options and best practices. Barriers were also encountered in the routine practices of the sector (designers and construction firms tend to rely on traditional and proven solutions), in the existing institutions and regulations (it is not yet possible to lease a roof or treat it as energy-production facility for example) and in economic structures (the social value created is not yet monetized). Although the transition has been stimulated and structured by the EROP dialogue, it has also become clear that the 2 year timeframe that the CEO had set for this transition will not be enough. The transition approach employed will therefore need to invest in strategic and tactical type discussions promoting the way of thinking, insight in the complexity of the issue and facilitate changes from within the existing regime institutions. The case also demonstrated that resistance to systemic change can occur in terms of existing structures, culture and practices (ranging from regulation, construction codes, to the practices in the manufacturing of roofs and the design of buildings).

The success of their open and transition focused approach so far highly depends upon the CEO and his ability to create a high quality team around him and to develop and communicate the broader narrative. Based on the ESHA team's personal motivation and ambition it became possible to invest quite substantial amounts of time and money in this process (more than a year was invested in developing the whole program), without a very clear or certain perspective on huge returns on this investment. Our findings identified a strong stated belief in the quality of their products and the opportunities for expanding

their activities and profit on the long term. In traditional terms such an approach would seem perhaps too risky for one firm, for example because of the fierce competition on minimal construction cost in this sector and the absence of mechanisms through which societal benefits of sustainable roofs can compensate the extra investments. EHSA was able to use a transition approach to roofs because it was able to simultaneously run a solid business (in other areas), thus enabling the CEO and other actors to invest time and resources in order to innovate and experiment with the green roofs.

By strategically tuning into the current political debate and favorable climate for sustainability in the Netherlands, EHSA's 'roof-transition' has been adopted by national policy as one of the central innovation programs that needs to deliver concrete results the coming years. For ESHA this has induced internal reorganization based on the developing transition strategy and the appointment of new employees with novel competences (such as chemical engineering). Concretely, they have now set up a strategy and lobby group (to exert high-level pressure), a new technology research group, an operations group (to implement and monitor projects) and a new R&D group, all specifically linked to the transition strategy. It will however depend on whether their ideas and strategy will be taken up by competitors in the market and get the necessary institutional and governmental support whether they will be able to actually overcome the regulatory, institutional and economic barriers that still exist.

Business development for sustainable transportation and energy

Pon Holdings provides us with another example of a new business strategy for dealing with and anticipating structural changes in the business environment. Pon Holdings is a large concern with about 50 subsidiaries active in automotive and equipment and power systems³. Recently, public attention for sustainability issues like air quality and climate change has grown rapidly, being covered almost daily by the media. In the Netherlands, professional attention to these issues may have increased even more because of the strategic discussions and experiments organized within the Energy Transition process (established by the Dutch government), involving many companies, NGOs, government and knowledge institutes. The director of business development of Pon Holdings took part in several discussion groups and conferences on alternative mobility and energy solutions⁴. He recognized a number of societal developments and problems, such as worsening air quality, CO₂ emission and climate change, which increasingly intertwine with Pon's business as basically all products include motors and fuel use. Instead of waiting to see how the market would react to the changing environment or what governmental regulations will follow, the director proposed to anticipate the market's needs by innovating products towards more sustainable ones. The CEO agreed to install an internal sustainability platform for this.

³ See www.pon.nl

⁴ Pon is a member of the Dutch Platform Sustainable Mobility and Platform New Gas and visited several conferences on this topic, e.g. those organized by Foundation Energy Valley

The mission of Pon's sustainability platform is to work together with suppliers, partners and clients for a profitable position in the market by applying alternative fuels for sustainable energy and transportation. An important goal of the platform is to create space for sustainable innovations by sharing successes among Pon's businesses and opening up mindsets of managers, engineers and salesmen within the firm and also within key actors in other organizations. For instance, one interviewee explained that it was necessary to first present a successful sale of buses with gas motors to bus and truck salesmen in order to open up the dominant culture within the firm, which is based around diesel motors: "the people who sell buses were competing with a sort of diesel culture that exists amongst people of truck companies, transport companies and bus companies, but also amongst own colleagues, who were familiar with diesel". Innovation in one business unit also serves as an example for another innovation at the other side of the company. From each business unit people with innovative ideas are selected as front-runners that could also act as a champion within their own business unit. Another part of Pon's sustainability strategy involves the development of training programs on sustainability for their sales force.

Pon Holdings also works with external partners to realize sustainable energy and transportation. They for instance organized a four-day conference on sustainability to discuss sustainable transportation with clients and experts and initiated a coalition for developing biogas as a fuel. This Coalition driving on biogas (CROB in Dutch) aims to offer the whole chain of a more sustainable form of (public) transport, from production and conversion of biogas to the final use in buses or other vehicles, ultimately for equal costs. This system innovation does not prove easy to implement. Driving on biogas requires different production processes and storage of fuel. Bus companies have to adjust their fuelling methods, regulations need to be changed and concession-granting organizations need to reconsider their granting criteria. To facilitate implementation, Pon found that it was critical to make the choice for transportation on biogas easier for bus companies and local representatives. One effective way to do this was to decide for a number of companies to collaboratively develop the whole chain of activities necessary to use biogas for transportation: they formed the Coalition driving on biogas.

However, Pon and the Coalition CROB still needed to address purchaser concerns: why should their provincial clients choose biogas when it requires certain vehicle investments and extra training of bus personnel, which makes biogas more expensive than driving on diesel? Through trial and error, CROB developed a method to convince provincial government representatives of the advantages of driving on biogas for the city as a whole. Provinces could then in turn adjust their granting criteria, so that developing buses on biogas became more attractive for bus companies. In their presentation of the alternative fuel, CROB did not only point to the direct environmental gains, but showed how biogas can easily replace natural gas as the next step in the transition towards hydrogen. During this experimentation, CROB found that directly approaching a government representative could be counter effective. For example, one representative that wasn't well informed about CROB's plans before meeting them, decided that he did not want to get involved in this innovation because that would make him politically accountable for something he didn't know details about. In addition, CROB found that

working only with the environmental department of the provinces (which typically favor driving on biogas for its sustainability effects) also turned out to be insufficient as the real power for decision making was with departments of transportation instead of environmental affairs. The coalition partners learned that a step-wise process was more fruitful than directly approaching representatives. CROB asked proponents of their concept from the governmental organization (usually environmental people) to bring their colleagues from different disciplines at the table, to discuss the consequences of alternative fuels for the province in all its aspects. Concurrently they asked civil servants to inform the representative in question in time. CROB aimed at starting a few experiments in different Dutch provinces to learn about possibilities and difficulties and further develop the infrastructure for biogas as a fuel. In order to cover the initial extra costs of driving on biogas CROB successfully applied for governmental subsidies, which have become available for innovative projects contributing to the Energy transition in the Netherlands. In this way CROB succeeded in establishing projects in two provinces of the Netherlands with buses and company cars that will drive on biogas, starting in 2008.

Discussion: challenges and opportunities of strategic business development for sustainability

Theoretical insights

As our case examples indicate, both firms have used system and transition thinking to develop an alternative strategy for dealing with persistent sustainability problems in the energy and mobility systems. ESHA started with the recognition of a number persistent problems like poor air quality and water problems and strategically developed a broad discussion and action plan on innovating roofs. The departure point for Pon Holdings and CROB was a recognition of climate change, air quality problems and dependency on fossil fuels, leading them to develop alternative fuel and energy solutions on a coalition basis and in an internal innovation platform. At the same time, each company continued its regular business. Thus, their transition strategies were conceived of as innovative experiments which ran parallel to their regular and ongoing business. By creating space (financially, institutionally and mentally) for fundamental reflection, debate and innovation, the necessary time for developing innovations is secured while at the same time matured ideas can be transferred to or even transform the core business. To deploy such a strategy, an organization needs to develop the capacity to have concurrent flexibility (experimentation) and stability (Boons & Roome, 2005). External cooperation and discussion seems to increase an organizations' sensitivity for environmental developments. Higher environmental awareness is likely to foster co-evolution between sustainable innovations and creating sustainable societal systems. Our cases suggest that a changing political and societal environment in terms of attention for sustainability issues poses challenges on firms, but also creates opportunities for new strategies. By identifying sustainability issues at societal level that relate to the firm, firms are able to redefine their own products and services and restructure their own practices and organization.

Both cases also illustrate that a transition management approach is not easy to implement and has the best chances for survival when it is initiated as ‘shadow-track’ besides regular business activities. Core conditions for this to succeed seem to be a motivated high-level manager and management support for such an experimental business development, enough funding and time for development and a gradual attunement between the shadow-track and regular policy when ideas and innovations mature. Finally, the Dutch government’s macro level support of transitions (in terms of both resources and political legitimacy) were integral to firm innovation and strategic planning. The Dutch government’s policy on Transitions created institutional space for systemic experimentation.

Our cases suggest that the three levels of the transition management approach help to point out the purpose of organizational activities in the larger societal systems and their relation to activities of other organizations in this system. For example, at a strategic level several innovative individuals in the Energy transition set goals for creating sustainable mobility and developing green gas. Within these goals, several companies formed a coalition (CROB) to develop an alternative fuel (a subsystem goal) and overcome barriers – like concession granting criteria, unfamiliarity with the fuel and new fueling methods – for its usage (tactical level). They initiate two experiments to learn about possibilities and challenges for using biogas in different types of transportation (operational level). While the main goal of CROB is to realize biogas use for transportation, requiring tactical activities, the strategic discussion place CROB’s activities in the perspective of sustainable mobility and pilot projects will be needed to realize broader implementation. This case, and the case of ESHA suggest that, although a firm focuses more on one level, it needs to relate to activities at the other levels as well in order to stay tuned to structural changes in their sector or industry.

Strategic level

The main aim of the strategic level of transition management is to develop a sustainability vision and goals at societal systems level amongst few forerunners from different societal sectors, based on system analyses. The ESHA Group utilizes these insights by starting from the analysis of multiple sustainability issues, ranging from CO2 emission and water problems to safety issues in buildings. ESHA has involved innovative thinkers from government, competing business, and NGOs (in the EROP platform) to structure the problem(s) and set long-term ambitions and goals. They are this way creating a strategic network (arena) that internalizes the new perspective and provides support and public pressure. Creating sustainable societal (sub)systems requires collaboration with multiple parties (Gray, 1989, Westley & Vredenburg, 1997). Concurrently, they have identified and developed alternative applications of the core product: bituminous products, and discussed how these could conceptually contribute to dealing with the problems.

In practice, initiating such strategic discussion means that a firm needs to give space (mostly in terms of time but also in terms of competition) to innovative individuals to participate in this process and provide them authority for articulating strategies of organizational change that can realize broader societal ambitions. Commitment to

sustainability from top management and a longer time-horizon supports such an approach. Research shows the individuals participating in such arenas should be “able to redefine and reframe a complex issue and articulate abstract but coherent and believable solutions and strategies that are fundamentally different from the mainstream” (Loorbach, 2007: 107). Participation in some of the Energy transition platforms and other conferences made Pon Holdings and other companies think about how problems of worsening air quality and climate change affect their business and could be turned into new business opportunities. Based on challenges in both energy production and transport fuels, the coalition driving on biogas used losses of current green electricity production based on heat power to produce biogas for both households and as a transportation fuel. They presented driving on biogas as the next step in the transition to driving on hydrogen. Our cases suggest that an important first step to engage in transitions is to determine to which particular societal issue(s) or transition(s) a firm can contribute. This strategic choice could be based on the characteristics of (sub)systems, that of the firm (specifically the firm’s relationship to the problem) and the anticipated impact the firm has on the problem, society at large and the firm itself (Margolis & Walsh, 2003).

Tactical level

At this level the firm should look for ways to further their own interests in line with societal goals formulated at the strategic level. This could imply developing strategic coalitions with other firms and organizations and collaboratively developing alternatives (pathways) to the current system, like transportation on biogas. The partners in CROB were deliberately chosen to enable provision of all products and expertise necessary to drive on biogas. It also implies lobbying towards governmental organizations in terms of developing new regulation or financial instruments, conceptualized by Bendell and Kearins (2005) as managing the ‘political bottom line’. In case of CROB the attainment of political support, change of specific rules (concession granting schemes), and governmental financial support proved critical to initiate the two first projects. In terms of management, this means the firm needs to create space for research and development, for inter-organizational collaboration and development of new business models. This could be achieved by restructuring the business organization or developing new structures to facilitate targeted activities that stimulate change and innovation in these areas, which is illustrated by the new organizational structure set-up by ESHA. In the broader network around a sustainability issue, but also in specific coalitions, businesses should be aware of dependencies and power relations, as these may influence the outcomes and problem solving capacity of networks (Boons, 1998).

Operational level

Operationally, transition management aims to bring together diverse actors in concrete experiments, to learn about different aspects of an innovation – such as user preferences, regulation, ecological impact and new organizational forms. The purpose is to explore the potential contribution of an innovation (societal, technological, institutional and/or behavioral) to a desired sustainable system (e.g. a clean, affordable and secure energy system). On the one hand the aim is to develop products and services that fit the

strategic goals, on the other to do this in a societal (real-life) setting to explore barriers for implementation and how they can be overcome. The case of CROB, the intra-organizational coalition initiated by Pon, demonstrates how resistance over driving on biogas can be overcome amongst local decision makers. Two projects are starting soon – with respectively 26 buses and 20 buses and 80 company cars – both using regional produced biogas. These pilot projects give the opportunity to develop and test the local infrastructure and other necessary changes for driving on biogas. ESHA is for example developing local projects in which they collaborate with building owners, local government (water boards for example), project developers and construction industry to develop spatial plans for combinations of energy-, water buffering- and green-roofs. Constructions based on this approach will only start in 2008, but the collaborative and experimental approach is leading to increased enthusiasm, willingness to invest in sustainable solutions and insight in novel possibilities at a concrete level amongst the other actors. Presumably, this could in time stimulate the demand for the specific solutions.

As we have shown, the transition management approach could be used by individual firms to adjust to and anticipate structural changes in societal systems towards sustainability. Next to daily business activities, this requires a different process with a different scope. Although activities at all three levels seem necessary to eventually create structural changes in a sector or region, some firms will be better equipped to practically experiment with new innovations while others are able to think and discuss in more abstract terms about causes of persistent problems and sustainability vision. The next table gives examples of the activities at different levels found in our cases. We believe that the transition management approach offers a sensible framework for analyzing these co-evolutionary mechanisms (Porter, 2006) as it starts from a societal systems perspective, but also distinguishes different levels of action. Transition management builds on ideas around co-evolution between organizations and their environment (Porter, 2006), and the potential of innovation to benefit sustainable development. It however adds the action perspective: through systematic analysis of ongoing processes of social change as transitions, individual organizations are able to identify dynamics and strategies to deal with social change more systematically and strategically. It thereby offers chances to contribute to sustainable sectors or industries and at the same time opens up new chances for intra and inter-firm innovation. Ultimately, as the ESHA case shows, it could function as an approach to also restructure and reorient an organization based on new business concepts.

<i>TM levels</i>		ESHA Group	PON Holdings / CROB
Strategic	<i>Process</i>	Starting EROP dialogue (transition arena) to develop understanding and support for the over-all process of 'roof-transition'	Take part in strategic discussions on sustainability (e.g. participation in Energy transition platforms)
	<i>Scope</i>	Linking the different types of roof-solutions to energy, water, health-problems Formulating a new paradigm to develop roofs Formulating ambitious targets	Linking climate change, air pollution, depletion of oil to core business (transportation & energy) and develop alternative fuels for sustainable energy and transportation
Tactical	<i>Process</i>	Forming coalitions with ministry, housing corporations and innovators in the sector Restructuring their own internal organization, setting up new teams and hiring new staff	CROB: forming a coalition to develop a clean transportation system: whole chain of activities necessary to enable driving on biogas
	<i>Scope</i>	Developing thematic images and transition pathways Identifying institutional and regulatory barriers	Addressing barriers for implementation, such as local decision making, concession granting rules, behavioral change, extra initial costs
Operational	<i>Process</i>	Setting up local experiments and projects with possible partners Starting up new business development and communication	Setting up pilot projects with provinces, bus companies and local biogas producers
	<i>Scope</i>	Redefining local roofing demands in terms of sustainable social solutions	Learn about potential and difficulties of driving on biogas for realizing sustainable mobility in the Netherlands

Table 1: examples of types and scope of processes at different levels of transition management

A central outstanding strategic issue is how can firms deal with tensions between the innovative 'shadow-track' and at the same time resist pressure from the existing regime, both within the firm and the sector or system it seeks to change. To deal with these pressures and to effectively contribute to evolutionary changes in these regimes, it is necessary to continuously find strategic partners, anticipate windows of opportunity and respond quickly to newly emerging developments and innovations. Like other studies have argued (Boons & Roome, 2005, Porter & Kramer, 2006), our cases suggest that the

interdependencies between firms and society offer opportunities for new business development. This requires a systems perspective to recognize and activate the potential of such co-evolutionary mechanism, next to a fair amount of capital, time and energy. Because of increasing interdependencies in society and the unpredictability of speed and direction of changes, it is not possible to formulate a blueprint or general approach for individual firms to deal with societal complexity, sustainability issues and organizational change in this context.

Nevertheless, our cases support the argument that multi-stakeholder processes help to understand societal problems and its causes (Gray, 1989, Svendsen & Laberge, 2005). The cases suggest, however, that different types of interrelated multi-stakeholder processes are needed to create a structural change of a system. Strategic envisioning to direct change, coalitions developing alternative pathways and dealing with resistance to change and practical experiments to learn about (im)possibilities of innovations. The type of involvement of a firm in systems change depends on both firm and individual capabilities and competences. Although the actual implementation and design of sustainable systems heavily depends on the individuals involved, the specific product and sector, and the ongoing social dynamics, we have shown that general characteristics and principles can be formulated for transition management. The basic notions and framework of the transition management approach seem to provide a proper basis for firms to adjust their business development to societal dynamics and anticipate changes towards more sustainable systems strategically.

Conclusion

Our findings provide empirical insights into how firms engage in innovative experiments to address systemic societal problems (Porter 2006). Our cases provide a new perspective on strategic business development in congruence with the development of sustainable systems, which shifts the locus of sustainability from the firm to the system. Although the transition management approach in the Netherlands has so far focused mostly on governance at a macro level, transition management has potential to support firms to adapt to and anticipate future structural changes in societal systems and influencing them towards more sustainable directions. We argue that next to earning a 'license to operate' through CSR and environmental improvements, firms need to learn how to initiate and participate within societal transitions at multiple levels in order to more effectively address persistent societal problems. Persistent sustainability issues are too complex and interconnected to be addressed by single organizations. As such, we argue to focus on co-evolutionary mechanisms between firms and larger systems in creating a (more) sustainable society.

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