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The practice of transition management: Examples and lessons from four distinct cases

Derk Loorbach^{*}, Jan Rotmans

Dutch Research Institute For Transitions – Drift, Erasmus University Rotterdam, Burgemeester Oudlaan 50, P.O. Box 1738, 3000 DR, Rotterdam, The Netherlands¹

ABSTRACT

In this article we present four different cases of transition management in which we were involved over the past 10 years. Transition management was developed in the course of this period in theoretical and practical sense, mainly in the Netherlands, as novel mode of governance for sustainable development. The theoretical debate about transition management is being increasingly published, but so far only few empirical examples were. In this article we present four cases that combined give a representative illustration of both the advantages and the difficulties of actually trying to manage transitions. The article ends by drawing lessons and formulating research questions for the future.

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1. Introduction

Transition management [1,2] has rapidly emerged over the past few years as a new approach to dealing with complex societal problems and governance in the context of these problems. In the Netherlands, UK and Belgium, serious efforts have been and are being undertaken to develop transition policies in areas such as energy, building, health care, mobility and water management. This is the result of a much broader scientific development of transition research as an interdisciplinary field of study in which innovation studies, history, ecology and modelling are combined with sociology, political and governance studies and even psychology. Because of the focus on integrated sustainability problems and the applied nature of transition research, the natural interaction between science and policy has led to a continuous co-evolving theory and practice of transition management [3], following the tradition of post-normal [4] and sustainability science [5].

Since its introduction into the policy arena, transition management has been widely debated, challenged, tested, and because of this further developed, enriched and grounded scientifically [3,6–14]. The scientific debate has primarily focused on the theoretical side, also because empirical examples of the application have yet to be fully disclosed and published [15,16]. A number of cases have been published [3,17,18], but this article tries to broaden this empirical basis by presenting four distinctly different, yet conceptually quite similar cases. We present a case on a regional level (Parkstad Limburg), in industry (roof transition), on a sector level (the health-care transition), and outside the Netherlands (resource transition in Belgium). These cases illustrate both the generic as well as the context specific nature of the approach.

We will not only present, but also draw lessons from 10 years of transition management in practice. In our reflection, we find that the learning-by-doing approach of transition management presents a useful and increasingly robust strategy for accelerating and guiding social innovation processes. The transition arena, a specific network of frontrunners, is key in our experiences: through co-production of a common language and future orientation, everyday practices can be slightly

^{*} Corresponding author.

E-mail addresses: Loorbach@fsw.eur.nl (D. Loorbach), Rotmans@fsw.eur.nl (J. Rotmans).

¹ <http://www.drift.eur.nl>.

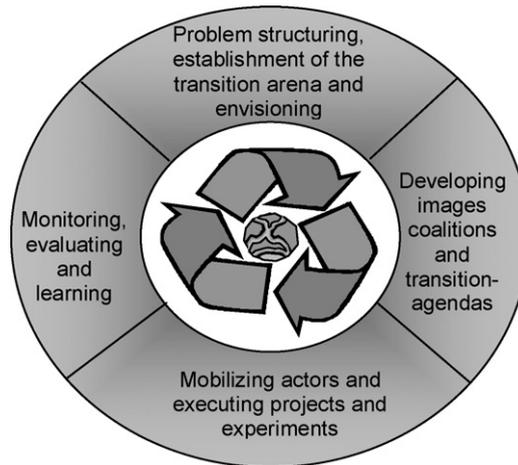


Fig. 1. Transition management cycle.

changed over a longer period of time. By building up a broadening network of diverse actors that share the debate, thinking and experimenting, conditions are created for up-scaling of innovation and breakthrough of innovations. We will argue that this is at the heart of transition management: by actually implementing transition management in a structured co-production process, new insights emerge, are implemented and reflected upon in a continuing way.

2. Transition management: what is it and where did it come from?

The fourth Dutch National Environmental Policy Plan [NMP4, 19] introduced transition management as official government policy. The NMP4 broke with dominant policy traditions and practices and created space for innovative policy experiments with transition management. The NMP4 did not set goals but formulated general societal ambitions, which were believed to require transitions, fundamental changes, in functional systems [1,20]. The NMP4 was widely discussed within the scientific community in the Netherlands, leading to both support as well as criticism upon the concepts [21]. In hindsight this was the start of an interdisciplinary debate leading up to a new research paradigm and community [22] and inspired application of the approach in a rapidly broadening number of areas.

The NMP4 borrowed from Ref. [1] the idea that management of transitions requires the following things:

- To deal with uncertainties, for instance through the use of scenarios.
- To keep options open and deal with fragmented policies: to stimulate knowledge and technological change, to pursue innovation and incremental improvements, to take a multi-domain view with attention to all relevant actors.
- To have a long-term orientation and to use this for short-term policies.
- To pay attention to the international aspects of change processes and find solutions on the right scale.
- A set of specific tasks for the government, namely to stimulate, mediate, engage in brokering services, create the right conditions, enforce its laws and engage in steering.

These very general basic principles were already at that time translated into an operational model for implementation; the so-called transition management cycle [23] (see Fig. 1). The components of the cycle are²: (i) structure the problem in question and establish and organize the transition arena; (ii) develop a transition agenda, images of sustainability and derive the necessary transition paths; (iii) establish and carry out transition experiments and mobilize the resulting transition networks; (iv) monitor, evaluate and learn lessons from the transition experiments and, based on these, make adjustments in the vision, agenda and coalitions.

The core idea is that four different types of governance activities can be distinguished when observing actor behaviour in the context of societal transitions:

- Strategic: activities at the level of a societal system that take into account a long time horizon, relate to structuring a complex societal problem and creating alternative futures.
- Tactical: activities at the level of subsystems that relate to build up and break-down of system structures (institutions, regulation, physical infrastructures, financial infrastructures and so on).
- Operational: activities that relate to short-term and everyday decisions and action. At this level actors either recreate system structures or they choose to restructure or change them.

² For extensive description of these activities, see Refs. [3,24].

- **Reflexive:** activities that relate to evaluation of the existing situation at the various levels and their interrelation of misfit. Through debate, structured evaluation, assessment and research societal issues are continuously structured, reframed and dealt with.

These activities exhibit specific characteristics (in terms of the type of actors involved, the type of process they are associated with and the type of product they deliver) which makes it possible to (experimentally and exploratory) develop specific 'systemic instruments' and process strategies (see also [3], Chapter 5 for details). Examples are participant selection, framing the specific transition challenge, type of process needed, use of different types of policy and process instruments [18,25]. The very idea behind transition management is to create a societal movement through new coalitions, partnerships and networks around arenas that allow for building up continuous pressure on the political and market arena to safeguard the long-term orientation and goals of the transition process.

Transition management is now defined as a deliberative process to influence governance activities in such a way that they lead to accelerated change directed towards sustainability ambitions [26,27]. Transition management is meta-governance: how do we influence, coordinate and bring together actors and their activities so that they reinforce each other to such an extent that they can compete with dominant actors and practices? Transition management has over the past decade evolved into a generic governance approach with specific practical instruments and methods. James Meadowcroft describes transition management as follows:

'Fist, the theory has a modular structure, with several elements being combined to produce the whole. Particular components include: the image of the transition dynamic with the distinct stages of the transition process; a three level analytical hierarchy of 'niche', 'regime' and 'landscape' that provides a framework for understanding transition processes; a basket of future oriented visioning devices (goals, visions, pathways and intermediate objectives); a practical focus for activities (arenas and experiments); and a broad 'philosophy of governance' that emphasizes decision-making in conditions of uncertainty, and the gradual adjustment of existing development pathways in light of long term goals'. [3]

3. The surprising diversity of transition management practices

In this section we describe four cases in which transition management has been applied. In the literature on transition management, the application of transition management by the Dutch ministry of Economic Affairs has been extensively documented, analyzed and described [18,28–30]. There have however been a large number of other experimental projects, all adding to the growing theory and practice of transition management, which have not yet been presented in the scientific community or international arena. These have however been perhaps even more important for the development of transition management. To illustrate not only the wide range of applications, but also how the general approach of transition management has been implemented in different context we here focus on four different cases in totally different areas:

- **Region:** A transition arena in the south of the Netherlands (Parkstad Limburg).
- **Industry and business:** The 'roof-transition program initiated by the market leader in roofing materials.
- **Sector:** The transition program in the health-care sector commissioned by the Ministry of Health.
- **International:** in Belgium in the area of sustainable waste and resource management.

3.1. Parkstad Limburg

The first experiment with the transition management approach was on a regional scale, in Parkstad Limburg, a former mining region in the south of the Netherlands [3] and started in 2001. Parkstad Limburg is a cooperation of 8 municipalities, but struggled to come up with shared and guiding ambitions for the future that would lead to more regional cooperation. The basis for the project that should lead up to the vision was formulated in *Vision development for Parkstad Limburg in transition* [31]. The first step in the project was to perform a system analysis (based on the so-called SCENE-model [32]). The study drew mostly from existing sources³ and was complemented with several interviews. It resulted in the *Situatieschets Parkstad Limburg* [33]. This analysis distinguished, in line with the transition concepts, between external trends and internal developments and projected possible transition scenarios [34,35]. By placing the analysis in a long-term perspective, historic transitions were identified. The document concluded with a synthesis that described Parkstad Limburg as a system and analyzed its state of development as predevelopment, but close to take-off.

Based upon this analysis and on transition management, the envisioning process was designed and participants were selected. The concept transition arena was introduced to create a forum separate from the political arena to assure a more social process of visioning and agenda-building with a focus on the long-term. The project team selected participants with a variety of backgrounds: a housing corporation, media, business and industry, an environmental NGO, the Church, the tourist agency, the regional theatre and health care organizations. In a period of 11 months, the core group met 10 times including a meeting with the advisory board (people who attended the kick-off meeting as well as other interested actors).

³ For example on regional profile, economic structure and performance, environmental quality, crime- and safety-figures, the demographic profile of the region, housing needs of the regional population.

Key elements in the transition arena process were the definition of a joint problem and the articulation of 'necessary choices' or guiding principles for a desired transition. What was ultimately defined as a shared problem definition was that Parkstad Limburg (regional level) should be the minimal scale to operate on. It was concluded that this would be a good starting point to develop the vision, but that additionally the different sub-themes should be worked out more concretely in smaller working groups including domain experts. Out of this process in which 'arena's of arena's' evolved. The main message was that Parkstad Limburg should focus on EU-regional cooperation, green economy, health-care combined with housing, education focused at regional industry and recreation. For this, a large number of activities were formulated in terms of infrastructure development, organisational cooperation, investment in projects and so on. The final document, "Op Hete Kolen" (On Hot Coals) [36], contained all the elements of the transition arena process; the problem analysis and definition, the shared guiding principles, the selected sub-themes and their transition images. It also identified transition experiments and projects possible within the sub-themes.

The impact of the project must be mainly assessed in terms of process impact, rather than only the production of a report. The most striking result of the project was the decision of the municipalities to start the process to form one region, one of the main barriers identified beforehand. In November 2005, the cooperating municipalities agreed upon the so-called Wgr+ regulation (*Wet gemeenschappelijke regelingen*, law on joint regulations), which basically meant the transfer of authorities from municipal to regional level. The consensus that was reached and the argumentation behind the agreement were explicitly based on the problem analysis and recommendations from the final report.

The new regional spatial plan developed by the council literally based itself on Op Hete Kolen and proposed very similar guiding principles, necessary choices and transition paths [37]. Another concrete result was the spatial study "At home in Parkstad Limburg", commissioned by the Parkstad municipalities and the three major housing corporations in the region. The regional newspaper wrote the day after presentation: "The housing vision is part of the Parkstad vision 'On hot coals' that was presented by the end of last year. In this vision, Parkstad strongly expresses the will to develop a better living and housing environment." [38].

Other concrete follow-up activities still are also taken up by the Parkstad Limburg Development Organization.⁴ This organization already existed prior to the project but was unable to find either a coherent strategic agenda or a legitimate mandate to act. The transition vision has become a guideline for their operations, leading to for example an image campaign (targeted at Parkstad Limburg residents to create awareness of the regional profile, history and future), a co-siting project for regional SME's, care-services market (development of diversified services in health care) and the project "Parkstad's third age" (creating awareness about ageing population and formulating 250 concrete actions). In a sense, the PLDO has taken over the role of the transition arena as a societal platform for innovative ideas and action based on shared long-term goals.

On a more general level, it seems that the individuals involved in both the transition arena and the process that evolved around the transition arena stimulated the public debate and the general perception of the region. A growing number of actors seem to be convinced not only of the urgency to act but also of possible opportunities to turn the region around. The negative and self-pitying way of thinking seems to be abandoned by a growing number of actors. Some quotes from individuals show this: "we shouldn't depress ourselves because the processing industry is leaving the region. It changes, and we have to change with it" and "the strength of a region in flux is the opportunity to start something completely new" [39].

3.2. Roof transition

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 so-called roof transition. It was initiated by ESHA Group,⁵ 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. In 2007, the CEO of ESHA started up a new strategy to broaden the activities of ESHA and the context in which their activities take place: *roof transition*.

At a strategic level, technology developers, marketers, policy experts and a toxicologist 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 flat roofs in the Netherlands could be transformed into roofs that contribute to local sustainability within 10–15 years. ESHA adopted an innovative systems approach using this information: their vision was to gradually transform all roofs in the Netherlands to achieve a substantial reduction in CO₂ and promote of sustainable energy and efficiency. This would require a sector-wide structural change in thinking, structure and practice.

To facilitate this sector-wide structural change ESHA's CEO, an idealistic and innovative entrepreneur, launched the Earth Recovery Open Platform (EROP) mid 2007. EROP is essentially based on the transition arena model, involving individuals from municipalities and their local water boards (for example Leeuwarden, Groningen and Rotterdam), large manufactures of roofing products (such as Consolidated), a number of knowledge institutes (TNO, Wageningen University), a number of companies where implementation is envisaged (for example Schiphol airport), environmental NGOs, architects, urban planner and energy companies. Within this transition arena the vision itself was hardly questioned. The focus lay on how

⁴ <http://www.ontwikkelingsmaatschappij-parkstad.nl> (in Dutch).

⁵ www.zwart-gras.nl (in Dutch).

they, as a sector, could accelerate the desired transition. Success depends upon a multitude of innovations: new rules and regulation, new technologies, new design and manufacturing tools and practices, new financial schemes and so on.

The EROP platform subsequently developed different ambitious images of roofs producing energy, buffering water, cleaning air, storing heat, and cooling buildings. In the summer of 2008, the process led to the establishment of 'roof development companies' that exclusively scan areas of roofs that can be 'sustainably developed'. Their business is to develop roofs by creating extra value for municipalities, such as water storage, energy production or CO₂ reduction. 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 [40].

In terms of transition experiments, the platform is now in a process of co-developing experiments to implement these concepts. Examples are a project developing green roofs in the city of Rotterdam, a pilot at Schiphol airport and a number of projects in Nijmegen and Groningen. Also, ESHA opened the first 100% bitumen-recycling plant in 2008 and develops CO₂-extensive new roofing equipment. All of these initiatives 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) and geared towards fundamentally changing business as usual in their sector. By entering a cross sector process based on a shared transition, new roles and practices are being defined and experimented with, thereby trying to break away from existing routines [41].

One of the main accomplishments of the endeavour so far has been that 'roof transition' has become a shared future orientation and that the agenda has been adopted by not only the sector but also by national government. By strategically tuning into the current political debate and favourable climate for sustainability in the Netherlands, the 'roof transition' has been adopted by national policy as one of the central innovation programs for the built environment and the norms developed within EROP have been adopted as national policy.

3.3. Health-care transition

The Transition Program in the Care⁶ (2007–2010) is initiated by the Dutch Ministry of Health, Welfare and Sports and Dutch care sector organisations. The program aims to enable the Dutch care sector to fulfil the need for long-term care in a radically different way. The main governance approach in the program is transition management, with a central focus on transition experiments. These experiments involve exploring and learning about radical innovations in practice, in a real-life context in which the end user is central. The sharing of learning experiences, with the entire care sector, is a key underlying value.

The Transition Program in the Care started off differently than other TM processes with a portfolio of transition experiments, instead of first setting up a transition arena. The first step was to 'transitionize' [3] the existing plans for setting up a large innovation program. For over 2 years, the Ministry, the care sector organisations and the funding agency SenterNovem were discussing the implementation of a covenant (AWBZ covenant 2005–2007) which was to distribute 90 million Euros for innovation in the care sector. Then a combination of health-care experts, consultants and transition researchers (CC Care Advisors, Ernst & Young and DRIFT) were asked to come up with an alternative programmatic approach. They proposed to frame the experiments as 'transition experiments' and developed selection criteria based on transition management principles combined with sector-specific criteria.

An important element in the selection and later implementation of experiments was their potential for scaling up and diffusion. Other criteria included for example: connection to persistent problem, plausibility, motivation, ability and added value to the portfolio [42]. In the first round in 2007, 10 experiments were funded by 3495 Million Euros in total. A second round of experiments drew considerably more attention and submissions, leading to funding for 16 experiments (13 Million Euros in 2008 for 26 experiments in total). A number of additional selection criteria were formulated, also based on the experiences with the first round. For example criteria such as: radically changing the structure, culture and practices, focus on end user, involving other actors within and outside the care, and a thorough and plausible business case [42].

The experiments were selected because they contained on a very small scale possible solutions for perceived persistent problems in the sector. Theoretically stated, they each form 'scale model systems' for possible future subsystems. Two striking examples hereof are ACT-Youth and 'Buurtzorg' (District Care). ACT stands for Assertive Community Treatment. ACT-Youth is based on the idea that youngsters with multiple problems often never reach the institutions that should provide the (mental health) care they need. ACT 'turns around' the care system for this group by assertively approaching youth with often psychiatric problems, a dysfunctional family, tendency for crime, learning problems or a combination. Based on personal contact they try to find the roots of these problems and bring the different care specialities to the person in need. In doing so, they continuously run into system barriers in terms of separated financial flows, a system based on diagnosis and separated responsibilities and specialisms, bureaucratic procedures and so on.

The example of District Care is an experiment in the area of in-house care for mostly elderly people. Contrary to normal Dutch practice, the basic idea is to create small teams of district nurses (with different competences), give them their own budget and responsibility for a group of clients and let them decide for themselves how they do their job. This approach fundamentally differs from existing practice, in which very large-scale partly liberalised care-providers manage large areas

⁶ www.tplz.nl (in Dutch).

with clients and primarily stress efficiency and standardization. Even to the level at which a specific number of minutes is designed for each task (for example: changing diapers: 3 min). The District Care experiment shows that by circumventing the bureaucracy and trusting the professionals, care can not only be more cost-efficient but is also much more rewarding for the professionals. This is illustrated by the rapid growth of the model; within 2 years it has grown to over 1000 involved professionals in ca. 100 teams, posing a serious challenge to the existing regime.

In parallel to the experiments program, a transition arena has been set up. The above mentioned examples illustrate how these yield enormous amounts of insight in how the regime works, what possible alternatives are and especially what barriers are in a desired transition. The transition arena, with representatives from the whole sector (from directors, to nurses, to professionals to journalists), has started in 2008 and delivered a transition agenda mid-2009. In their discussions, they defined the basic problem to be the enormous gap between the 'system' and 'human'. Over the last decades, through specialisation, efficiency increase and liberalisation, people have been reduced to numbers and health-care provision into a factory in which products are efficiently transported through a chain of production facilities. The associated structures (e.g. financing mechanisms, over 80 000 diagnosis-treatment combinations) are now blocking the transition to a more self-organising, demand based and human-oriented way of care provision.

This future perspective is translated by the transition arena in a number of images (*what should care look like?*) and pathways (*how to get there?*), based on the already ongoing experiments. It is clear that the transition agenda will only be the first step in creating the necessary conditions at the regime level for scaling up the successful experiments. However, through clever process management, the program consortium is already trying to increase the chances for a successful launch, by for example involving funding agencies, engaging in political debate, mobilising the networks around the experiments and so on. So far, the project has been rather successful in reframing innovation in health care and developing a strong transition narrative.

3.4. Resource transition in Belgium

Flemish waste agency OVAM started in 2002 to think about the possibilities for a new generation of waste management that did not focus upon the management of waste but upon the management of production to prevent waste. This ambition brought OVAM official Walter Tempst to start a small scale transition project. Tempst, an entrepreneurial policy official with some influence within the organization and space to develop new ideas, took up transition management as an approach to reflect upon future developments and the necessity to develop policies for waste prevention instead of or on top of waste management policies for effective handling of waste. He initiated a transition project which was later called "food for thought" (in Dutch: *Stof tot nadenken* [43]), an internal OVAM project with two goals: to develop a new vision and agenda for their own organization and at the same time to transitionize the regular policy context by creating room for innovation within the organization in line with the vision and agenda.

This project aimed to understand the historic development from a transition perspective as a basis to start up internal discussions about the role and practices of OVAM and to possibly develop a transition arena process. A preliminary integrated system analysis was executed based on the Dutch waste-transition case study which was adapted to the Flemish context. The additional information was provided for a large part by about 10 OVAM employees, who in this way were actively involved in the analysis. A general assessment emerged from the group discussions that although waste management is highly successful in terms of efficiently managing waste, but that there are a number of problems that need to be dealt with: too many materials are wasted, the current regime does not benefit from prevention, public awareness and participation are almost absent, government or public control over sector development is almost impossible [44] and awareness about reduction and prevention among waste-producers is limited.

A desired transition was defined in terms of closed resource-loops, material cascading (use high-quality materials for high-quality products and application first), new materials and prevention. It was clear that this implied a fundamental paradigm shift: from developing policies focused on waste as an output to developing policies focused on the use of materials so that these would not become waste. Waste in this vision, should no longer be the sole domain of government, but a shared responsibility between all societal actors. This new course for OVAM would obviously require internal support and changes in organizational structure, in human resource management, in financial structure, in communication and profiling etc. Obviously such an internal transition would require time, energy, creativity and above all long-term continuation [43].

In the summer of 2006, the OVAM started a follow-up project that explicitly builds upon the analysis and process design developed in the aforementioned project: Plan C.⁷ This project essentially is a broader social transition arena initiated, facilitated and organized by OVAM, involving some 14 individuals with different backgrounds, relevant to the subject. They have backgrounds in business, science, government and NGOs and were selected based on individual competences, skills, network and creativity. Within a period of 6 months they produced a novel vision for sustainable resource management, often in their own time. The leading motto for their project has become: "Thinking further, dare to do".

Their transition vision is based on the idea of a fundamental change in how people consume. In a circular economy with integrated resource management as pivotal element, resource use is drastically brought down and re-use of resources is a basic design criterion. Such an economic production and consumption system would have, according to the transition arena,

⁷ <http://www.ovam.be/jahia/Jahia/pid/1602?lang=null>.

certain requirements that can be seen as the conditions for sustainability. The agenda has been discussed and elaborated in a much wider network at the tactical level and Plan C is now in the phase of defining, implementing and evaluating the transition agenda and experiments.

4. Generic lessons and insight from TM-cases

We end with a point-wise list of generic lessons and insights that we drew from the case studies that we briefly described above as well as from ongoing case studies in the Netherlands. In these cases the transition arena has a pivotal role. The transition arena, as other transition management instruments, is used in different ways simultaneously. They are used to develop new substance (ideas, agendas visions); to support a process (of network/coalition building, learning); and to subtly influence existing regimes or regime actors. Most lessons therefore concern the management of transition arenas, although we also draw from the experience with the broadening phase in which multiple networks are developed around the transition agenda and from the health-care transition in which we started from a portfolio of transition experiments and the network of operational frontrunners.

4.1. Context-specificity

Every transition project is unique in terms of context and participants and therefore requires a specific contextual and participatory approach. At the sector level, mainly professionals will be involved, but in a regional transition arena participants are often more emotionally connected to the subject for example. This means that there is no such thing as a standard recipe for how to manage transition projects. That also means that one will also be surprised by the developments within a transition trajectory, in particular within an arena. Arena processes are quite intense and emotional, full of tensions within participants and tensions between the environment and the arena. The informal aspects of such a transition trajectory are at least as important as the formal aspects. Preferably these processes transition processes should be guided by a team of experienced people with a variety of complementary skills and backgrounds.

4.2. Selection of frontrunners

The selection of frontrunners (pioneers, niche players) for a transition process is of crucial importance. In the beginning in Parkstad Limburg we did this intuitively, looking for people with original ideas who could think 'out of the box'. Gradually we learned that other competences are also important and that functioning of individuals in a group process is decisive for the success. We therefore developed a format for in-depth interviews of frontrunners that we standard use for screening potential candidates and a list of substance and process criteria for the selection of candidates for a transition arena. And we developed a psychological test for testing the psychological features of potential frontrunners, based on a validated psychological procedure. We now use these three elements (in-depth interviews, substance and process criteria and a psychological test) to select individual frontrunners and compose a balanced group.

4.3. Composition of a transition arena

A transition arena is an informal network of frontrunners within which a group process unfolds, often in an unplanned and unforeseen way. This puts high demands on the group composition. In terms of group dynamics, a group is much more than the sum of the individuals. In general, it takes a few iterations before a stable, diverse and representative constellation has been formed for a transition arena. Some frontrunners leave, new ones enter, which gives some dynamics that might be fruitful for the group process. In this sense an arena process is an evolutionary process with continuous mutations. We also learned how important a balance is between niche players and change-inclined, innovative regime players. In fact, the latter are also niche players, but with invested power operating within the regime. In a transition process we need both pioneers operating outside and inside the incumbent power structures. Although we cannot give a quantitative division between the two groups of pioneers, the off regime niche players need to be in the majority.

4.4. Space for frontrunners

Frontrunners are key to transition processes. Frontrunners, in particular real go-getters with an overly amount of energy and enthusiasm to combat the many hurdles within the regime, need support and especially space for their innovation activities. Innovation space for frontrunners turns out of crucial importance in transition processes. Not so much financial space only, which obviously plays a role, but in particular mental space, organizational space and juridical space. For instance, the concept of a "minimally regulated space" as experimental zone in which frontrunners can manoeuvre more or less freely seems important. A transition arena itself actually is a created, relatively safe and free, protected environment without any power hierarchy which is aimed to stimulate the development of creative, innovative ideas and which can be used to generate more time and space to develop ideas and to create distance from the existing regime without losing touch. This free space should be guarded continuously and should never be taken for granted.

4.5. *The regime strikes back*

The autonomous character of a transition arena often makes the regime nervous, which forms the source of tensions between regular policy and the transition shadow trajectory. As a response to these emerging tensions, the regime has the almost unstoppable tendency to turn (back) into a command-and-control mode. The manifestation of such a command-and-control mode is the attempt to build up new institutional constituencies, such as task forces, advisory boards, and sounding boards. This arises mainly out of fear to give away the steering and control of the transition processes: it is a mere reflex to remain a handle on a complicated process the regime wants to be in charge of. These institutional constituencies reduce the free space created for frontrunners, even if they are established to support the transition arena and the frontrunners. From the transition viewpoint the only adequate response is to build up a close relationship with (parts of) the regime and maintain the autonomy of the transition process by tuning the free space, agenda and responsibilities of the transition process (and the arena within that) compared to the regular policy process.

4.6. *Be prepared for the unexpected*

A transition process is full of obstacles, barriers and surprises. None of the transition trajectories that we have been involved in went smoothly, on the contrary. Most transition cases we were part of passed off rather chaotically, which sometimes filled the client with despair. This temporary kind of confusion is part of the divergence inherent to the transition process and might stimulate creativity of the participants. However, this should be guided in a flexible, but determined way, always retaining to the guiding principles of transition management. The expected unexpected also indicates, however, that ample room should be reserved for unforeseen events, activities and products and that enough time and energy should be invested in managing the chaos and the turmoil. Transition arenas, if organized effectively, are the start of an evolving and expanding process, which needs to be acknowledged beforehand so that additional means and personnel can be reserved for later in the process.

4.7. *Impact and results of a transition process*

It is hardly possible to specify the concrete results or impact of a transition process. N.B.: with a transition process we mean a transition trajectory that follows the starting points of transition management and is guided by those principles. The more modest shorter-term goal is to build up innovation networks of frontrunners with an ambitious agenda of reform, starting with concrete breakthrough projects that illuminate the longer-term sustainability vision. We started with developing these networks at the strategic level, but as shown in the health-care transition, it seems as promising to start from innovation networks at the operational level. What we can specify in the short-term are indirect or intangible effects which are as important as the direct effects. Examples of indirect effects that we have signalled are: a new discourse, a new élan, a joint language, renewed trust and a shared perspective among participants. In particular a common language developed by participants in a transition arena is a critical success factor. The analytical framework of transition management can help to develop such a common language.

4.8. *Substance and process are intertwined*

Substance and process cannot be separated easily in a transition process. This requires a flexible and creative process management that is based on knowledge of the substance (often derived from integrated assessment) and from the process (derived from transition management). Experience with transition processes is almost a prerequisite for a successful transition trajectory. For instance, one of the more cumbersome and time-consuming parts is to arrive at joint problem perception. Many frontrunners see only parts of the problem or have difficulties with building an integrated puzzle of the problem. Usually, this takes much longer time than expected. On the other hand, it sometimes takes surprisingly little time to develop a joint vision. However, bridging the sustainability vision to the current situation through multiple pathways is often a problematic part of the process. The analytical structure behind transition management has proven to be a good standard for designing a process approach. Thinking in terms of problem definition, vision, images, pathways and experiments helps to structure a broad participatory process, offers a common language and allows for continuous integration, re-evaluation and adaptation. However, this is no blueprint at all: there is no such thing as a fixed order of steps to be taken in the transition management approach.

4.9. *Empowering frontrunners is key to a transition process*

Key to transition management is the empowerment of frontrunners. With empowerment we here mean providing them with multiple resources in order to be better equipped to play the power games with the regime. Both in the health-care transition as in the roof transition cases, through development of new regulation and changes in funding schemes conditions were created that open up space for more innovation. But with resources we do not refer only to financial resources such as subsidies, but also to mental resources. Such as a deeper insight into the complexity and persistency of the problem in question, by reframing that problem (including the impossibilities of solving the problem by a single actor) and by

transforming it into a sustainability challenge (including the possibilities to relate the rather abstract vision to concrete projects that partly shape that visionary future). After all, the arena itself is to be considered as an empowerment environment for the frontrunners selected. If the process goes well, the arena provides the frontrunners with an action perspective so that they better realize what their contribution could be to the bigger picture (sustainability vision). The process is meant to be self organizing, stimulating frontrunners to create their own space by gathering together their own frontrunners, forming their own innovation network, etc.

5. Conclusions and core themes for the future

Transition management has already come a long way and seems interesting enough for further exploration. The progress made in practice as well as the theoretical developments shows that modern times require experimental, innovative, multi-disciplinary and participative forms of governance like transition management. In line with the underlying philosophy we cannot be certain about this, but transition management seems to be in tune with present societal demands, research and policy. We are, however, also a long way from realizing a sustainable society, which means that there are ample challenges for the future. Without going into full detail, two themes seem to be central for future debate in this area: power and people.

Transition management so far mainly focused on the predevelopment phase of transitions: transition arenas with frontrunners structuring societal problems, developing transition visions and transition experiments. In the Netherlands at least, but arguably also in the broader International context, there now seems to be a socio-political momentum for transformative change. Theoretically speaking, the transitions in several sectors (in the Netherlands: health care, energy, water management, building and housing, agriculture) are moving to an acceleration phase in which a structural regime transformation takes place. Based on historical evidence, however, it is not unlikely that the existing structures and interests prevent the changes from diffusing, or that the societal support is not articulated and/or mobilized. Or that the transitional change leads us into an undesired direction of unsustainability, be it in economic, ecological or social sense. The crucial challenge for transition management will therefore be for the coming years to engage regime actors in the process and develop societal pressure so that the newly emerging niches and the innovative regime actors can co-create new societal regimes.

Wherever this process will go, it seems clear that the basic rationale driving the transition management discourse is a direction which needs to be further explored. Building on our case experiences and conceptual assessment, we believe the following questions will be central to transition management research for the coming years:

- What type of transition management do we need for other stages of transition, especially the acceleration stage?
- What does tactical and operational transition management look like?
- Are there alternatives to the concept of a transition arena?
- What do the next cycles of transition management look like, in terms of balance between the different governance types and in terms of systemic instruments?

These questions will be explored in the tradition of transition management research, by iteratively developing theoretical ideas and experimenting in practice. Knowledge and experience co-evolve with the 'real world' transitions and thus need to constantly be at the forefront of social change. In this perspective, it is not so much the idea that we need to change towards a specific goal, but that we need to deal with and think about societal change in a specific way. In doing so, the natural process of societal change becomes more reflexive and geared towards sustainability, in effect becoming sustainable development itself.

References

- [1] J. Rotmans, R. Kemp, M. van Asselt, F. Geels, G. Verbong, K. Molendijk, *Transitions & Transition management: The Case for a Low Emission Energy Supply*, ICIS, Maastricht, 2001.
- [2] P. Martens, J. Rotmans, *Transitions in a globalizing world*, *Futures* 37 (2005) 1133–1144.
- [3] D. Loorbach, *Transition Management: New Mode of Governance for Sustainable Development*, International Books, Utrecht, 2007.
- [4] J.R. Ravetz, What is post-normal science, *Futures* 31 (7) (1999) 647–653.
- [5] R.W. Kates, W.C. Clark, R. Corell, J.M. Hall, C. Jaeger, I. Lowe, J.J. McCarthy, H.J. Schellnhuber, B. Bolin, N.M. Dickson, S. Faucheux, G.C. Gallopin, A. Grubler, B. Huntley, J. Jager, N.S. Jodha, R.E. Kasperson, A. Mabogunje, P. Matson, H. Mooney, B. Moore, T. O'Riordan, U. en Svedin, *Environment and development—sustainability science*, *Science* 292 (5517) (2001) 641–642.
- [6] E. Paredis, *Translating system innovation and new forms of governance to a 'pristine' policy context*, in: *Politics and Governance in Sustainable Sociotechnological Transitions*, Blankensee, Germany, 2007.
- [7] C. Hendriks, *Making democratic sense of socio-technical transitions for sustainability*, in: *Politics and Governance in Sustainable Socio-Technical Transitions*, Blankensee, Germany, 2007.
- [8] R. Kemp, D. Loorbach, *Transition management: a reflexive governance approach*, in: J. Voss, R. Kemp, D. Bauknecht (Eds.), *Reflexive Governance*, Edward Elgar, 2006.
- [9] E. Shove, G. Walker, *Commentary*, *Environment and Planning A* 39 (4) (2007) 763–770.
- [10] J. Meadowcroft, *Environmental political economy, technological transitions and the state*, *New Political Economy* 10 (4) (2005) 479–498.
- [11] A. Smith, A. Stirling, F. Berkhout, *The governance of sustainable socio-technical transitions*, *Research Policy* 34 (2005) 1491–1510.
- [12] J. Rotmans, *Societal innovation: between dream and reality lies complexity*, in: ERIM (Ed.), *Inaugural Addresses Research in Management Series*, RSM Erasmus University, Rotterdam, 2006.
- [13] J.C.J.M. Van den Bergh, F.R. Bruinsma (Eds.), *The Transition to Renewable Energy: Theory and Practice*, Edward Elgar, Cheltenham, 2008.
- [14] A. Smith, F. Kern, *The transitions storyline in Dutch environmental policy*, *Environmental Politics* 18 (1) (2009) 78–98.

- [15] J. Schot, F.W. Geels, Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy, *Technology Analysis & Strategic Management* 20 (5) (2008) 537–554.
- [16] J. Rotmans, D. Loorbach, Complexity and transition management, *Journal of Industrial Ecology* 13 (2) (2009) 184–196.
- [17] S. Parto, D. Loorbach, A. Lansink, R. Kemp, Transitions and institutional change: the case of the Dutch waste subsystem, in: S.H.-C. Parto (Ed.), *Industrial Innovation and Environmental Regulation*, United Nations University Press, New York, 2006.
- [18] D. Loorbach, R. Van der Brugge, M. Taanman, Governance for the energy transition, *International Journal of Environmental Technology and Management* (2008) (Special issue on: "Transforming energy systems towards sustainability: critical issues from a socio-technical perspective").
- [19] VROM, Nationaal milieubeleidsplan: een wereld en een wil, Ministerie van volkshuisvesting, ruimtelijke ordening en milieu, Den Haag, 2001.
- [20] J. Rotmans, R. Kemp, M. van Asselt, More evolution than revolution: transition management in public policy, *Foresight* 03 (01) (2001) 15–31.
- [21] RMNO, Verslag van discussies met wetenschappers tijdens het NMP4 proces, RMNO, The Hague, 2000.
- [22] J. Rotmans, et al., Multi-, Inter- and Transdisciplinary Research Program into Transitions and System Innovations: Maastricht, 2004.
- [23] D. Loorbach, Governance and transitions: a multi-level policy-framework based on complex systems thinking, in: *Conference on Human Dimensions of Global Environmental Change*, Berlin, 2004.
- [24] D. Loorbach, J. Rotmans, Managing transitions for sustainable development, in: X. Olshoorn, A.J. Wiczorek (Eds.), *Understanding Industrial Transformation. Views from Different Disciplines*, Springer, Dordrecht, 2006.
- [25] R. Van der Brugge, R. Van Raak, Facing the adaptive management challenge: insights from transition management, *Ecology and Society* 12 (2) (2007) p33.
- [26] R. Kemp, D. Loorbach, J. Rotmans, Transition management as a model for managing processes of co-evolution towards sustainable development, *The International Journal of Sustainable Development and World Ecology* 14 (2007) 1–15.
- [27] D. Loorbach, In search of governance for sustainable development, *Sustainability: Science, Policy and Practice* 3 (2) (2007).
- [28] F. Kern, A. Smith, Restructuring energy systems for sustainability? Energy transition policy in the Netherlands, *Energy Policy* 36 (2007) 4093–4103.
- [29] J.C.J.M. Van den Bergh, F.R. Bruinsma (Eds.), *The Transition to Renewable Energy: Theory and Practice*, Edward Elgar, Cheltenham, 2007.
- [30] R. Kemp, D. Loorbach, Dutch policies to manage the transition to sustainable energy, in: J. Meyerhoff (Ed.), *Jahrbuch Okologische Okonomik*, Metropolis Verlag, Marburg, 2005, pp. 123–151.
- [31] ICIS, Vision Development for Parkstad Limburg in Transition, ICIS, Maastricht, 2001.
- [32] J. Grosskurth, J. Rotmans, The SCENE model: getting a grip on sustainable development in policy making, *Environment, Development and Sustainability* 7 (1) (2005) 135–151.
- [33] M. Van de Lindt, N. Rijkens-Klomp, D. Loorbach, *Situatieschets Parkstad Limburg: een regio in transitie*, ICIS BV, Maastricht, 2002.
- [34] P.W.F. Van Notten, J. Rotmans, M.B.A. Van Asselt, D.S. Rothman, An updated scenario typology, *Futures* 35 (5) (2003) 423–443.
- [35] A. Wiek, C. Binder, R. Scholz, Functions of scenarios in transition processes, *Futures* 38 (2006) 740–766.
- [36] ICIS (Ed.), *Transitiearena Parkstad Limburg, Op Hete Kolen*, Parkstad Limburg, 2004.
- [37] Stipo-Consult, in: P. Limburg (Ed.), *Regional Spatial Structure Plan Parkstad Limburg*, 2005.
- [38] Limburger, *De totale make-over van Parkstad, (The Total Make-Over of Parkstad)*, 2004.
- [39] *Limburgs-Dagblad*, *Kracht Parkstad ligt in het vernieuwende, (Strength of Parkstad Lies in the Innovative)*, *Limburgs dagblad*, 2005.
- [40] D. Loorbach, et al., Business strategies for transitions to sustainable systems. *Business Strategy and the Environment*, published online Feb 16 2009, doi:10.1002/bse.645.
- [41] L. Baas, Industrial symbiosis in the Rotterdam harbour and industry complex: reflections on the Interconnection of the Techno-Sphere with the Social System, *Business Strategy and the Environment* 17 (2008) 330–340.
- [42] S. Van den Bosch, *Transition experiments*, PhD Thesis Drift. Erasmus University, Rotterdam, forthcoming.
- [43] D. Loorbach, et al. in: OVAM (Ed.), *Stof tot Nadenken*, ICIS/OVAM, Maastricht, 2004.
- [44] J. Eberg, De nationale stempel op afvalbeleid, *Bestuurskunde* 7 (5) (1998) 228–236.