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Stakeholder participation if there is nothing at stake?

Scenario workshops for raising the quality of participation in Climate Neutral Urban districts

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Abstract

Sustainable development poses demands that are usually not met by dominant patterns of political decision-making. Scenario workshops can be used as a method that allows policy decisions to be made according to the demands of sustainable development, which involve the attendance of a long-term future, the implementation of new technologies, and the participation of a wide range of stakeholders. To develop further understanding about the efficacy of scenario workshop, a simulated scenario workshop was held in which policymakers in sustainable urban planning were engaged in a role play.

Introduction

Sustainable urban development appears to be complicated by dominant approaches of local (and also national) forms of policymaking. Existing patterns of decision-making in the policy realms have difficulty with the demands that are posed by sustainable development, which, among others, involve the combination of a long-term future orientation, the implementation of new technologies, and the cooperation with a wide range of stakeholders. This paper will propose scenario workshops as a method for local policymakers to meet the demands of sustainability in relation to urban development. Such workshops allow the attending of long term futures, they make it possible to take divergent social and technological developments into account, and they also enable the inclusion of public and stakeholder participation in local decision making.

We will first pay attention to regular patterns in public decision making. It will be shown how contingency is an elementary characteristic of decision making, which makes it hard to take a wide range of uncertainties into consideration. Subsequently, we will introduce the scenario approach, and we will describe how these scenarios can be used to overcome the effects of contingency and group think. To elaborate on these claims, we will present how a simulated scenario workshop on the fictional city of Clueburgh that was prepared and organized by the authors.

Contingency and the demands for sustainable development

Contingency in the policy domain

In policy analysis the messy and unpredictable nature of the policy domain has been acknowledged since Charles Lindblom claimed that this academic field can be seen as the 'science of muddling through' (1959). Lindblom depicts policymaking as a piecemeal and fragmented process, in which policy makers do not act, and cannot act, rationally and comprehensively. The findings of Lindblom have been corroborated by work on policy formulation and implementation, for instance by Wildavsky (1964) who described the political processes that characterized the establishment of a governmental budget, later followed by his work on policy implementation (Pressman & Wildavsky, 1984).

Another strand of research that is relevant here concerns the study of the organizational processes that lead to policy formulation. Cohen, March, and Olson (Cohen, March, & Olsen, 1972) coined the notion of 'garbage can model' to describe the process of policy formulation. These authors claim that most policy models are built on the following false assumptions: a) the formulation of policies is connected to a knowledge of alternative solutions for a problem; b) the formulation of policies is built upon the presence of knowledge about the consequences of choices; c) the formulation of policies is based on a consistent order of preferences; and d) there are clear rules for policy formulation. In reality, however, the policy process does not work this way. Building on Herbert Simon's account of 'bounded rationality' (1997), these assumptions can be said to fundamentally overestimate the time and information which policy makers have. Moreover, they neglect the fact that preferences may change as a result of the policy choices that are made, as well as that policy rules are only followed upon very loosely.

Opposed points of departure for describing the policy process that are proposed by Cohen et al. are 'ambiguity' and 'organized anarchy'. Ambiguity pertains to the knowledge that an organization has about its goals, about the information over which it disposes, and about its own history. Organized anarchy can be seen as a result of this ambiguity and relates to the presence of inconsistent preferences, unclear working processes, and a fluid involvement of people who contribute to the policy process. Instead of seeing the policy process as a rational endeavor, it is better to see it as a 'garbage can' in which problems and solutions are dumped by participants that happen to pass by. A decision can be seen as the result or an interpretation of a diversity of more or less independent streams that are present in an organization.

Kingdon (1984) specified the garbage can-model by identifying the different streams that are present in the decision-making context, in particular in relation to the phase of policymaking in which an issue is set on the political agenda. This agenda-setting process is described as the simultaneous occurrence of a salient problem, an available solution, and hospitable political conditions. In other words, Kingdon distinguishes three 'streams' in the policy domain. The first of these is the 'problem stream'. The rationale behind this stream is that a given situation has to be identified and explicitly formulated as a problem or issue, before it has the slightest chance of being transformed into a policy. The second stream is the 'solutions stream', which is concerned with the formulation of policy alternatives and proposals. The third stream is the 'politics stream', which is characterized by political events, such as an impending election or a change in government, but could also relate to the general political mood or the availability of political resources. These three 'streams' are perceived as largely independent entities; their emergence follows different social patterns, which makes their coincidence largely a fortuitous event, which takes place when there is a so-called 'window of opportunity'.

Group think

These findings from policy research imply that it is better not to represent the policy process as a rational process in which a well-considered balance of goals and means leads to a certain decision, but instead that it is better to see policymaking as a fundamentally contingent process in which coincidence and dependency on a specific history as well as a specific institutional and organizational context play a decisive role.

This contingency not only pertains to the phases of agenda-setting and policy formulation, but also to the legitimization of a policy proposal. The policy domain is characterized by a separation of functional responsibilities. Obviously there is the legislative branch of parliament and the executive branch of government, which both have their distinct place and role in the decision-making process. However, the division of responsibilities and roles goes much further than this bipartite division (for the time being, ignoring the judicial branch). We have different ministries, different levels of authority, etc. which basically means that different organizational sections have to *compete* with each other for resources and for the possibility to pursue its own plans and ambitions.

This division of tasks has great implications for the way policies are made. It implies that the development of a successful policy plan is mainly based on acquiring *support* for a particular policy plan. A coalition of advocates has to be forged which bears enough critical mass to eventually pass the highest executive and legislative levels. One may say that the game of policy-making is one of conflict and conviction, that works its way up from the 'inside' to the 'outside' (Stone, 2002).

In terms of the quality of decision-making the main problem of this mode of working is that it gives rise to *group think*, which is seen as the most common explanation for policy failure. The notion of group think was introduced by Irving L. Janis in 1972, and it was used to explain painful fiasco's in US foreign policy, such as the disastrous preparation to the Pearl Harbor attacks, the escalation of the war in Korea, the failed invasion of the Cuban Bay of Pigs, and the unwanted intensification of the American involvement in the Vietnam war (Janis, 1972). In each of these cases, the group of decision-makers in charge were pursuing consensus and harmony inside of the group itself, leading to the negligence of crucial information, to the failure to formulate policy alternatives, or the reluctance to take such alternatives seriously. Also when the group was confronted with news about recent, undesirable, developments, the group persevered in its chosen policy course.

The demands of sustainable development

How does this fundamental contingency of the policy process affect the ambitions of policy makers to pursue sustainable development? For sustainable development, we may find the following demands that have to be fulfilled in order to effectively pursue this goal (Mulder, 2006).

- Sustainable development requires a long-term perspective
- Sustainable solutions usually involve the application of new technologies
- The societal acceptance of such a new technology requires broad stakeholder engagement.

Though each of these demands is pursued separately in the policy domain, the contingency of policy processes makes it hard to comply with the *combination* of demands. Let us elaborate on this claim.

To start with, urban planning usually takes up a long-term orientation, however, it seems that this orientation is usually established by a top-down form of planning that contradicts the third demand (Boelens, 2010; Grunwald, 2000). One of the reasons for this is that such a long-term orientation is a difficult one to take by the general public or by stakeholders. They often have problems in imagining a consistent future, and they often have immediate demands or problems to be solved.

One may also see that local authorities are quick to take up new, promising technologies, they often do so in order to be considered frontrunners, very much driven by group-think processes in which for instance the reputation of a city is brought in as the main argument to do something, can be leading to a neglect of possible alternatives, budget overruns, and policy failures (Bruzelius, Flyvbjerg, & Rothengatter, 2002).

Stakeholder participation is also no new feature in urban decision-making, however, what usually happens is that a policy plan that is already formulated is presented to the public in a consultation round (or perhaps a referendum). In general, the role of the public is then limited to making small adjustment or refusing the package deal altogether (leading to great frustration among the policy-makers). Deviant voices that may be present in the public are not given the opportunity to be raised (Bogner, 2012). According to Bruzelius et al. (2002, p. 5), the relation between participation and technological projects can be sketched as follows:

In large scale projects, political parties, government administrations or various lobby groups often tend to promote or to try to block specific technical solutions. It is argued, for instance, that a tunnel and not a bridge should be built, or vice versa, or that it should be a connection for trains only and not a road and rail link, or vice versa, etc. The pro and con positions tend to be based on only aspects of the problem, and rarely take all features into account. This is quite natural because a more full picture of a proposed project cannot normally be formed at an early stage of the process. But it is in this early stage that the interested and involved groups make up their minds in ways that often do not change later, even if better and more relevant information is made available.

The question is how to combine these distinct demands of sustainability in order to pursue sustainable urban development? We will propose scenario workshops as a method that is able to bring these demands together. It enables the involvement of stakeholders, a long-term orientation, as well as a critical reflection on the position of new technologies against the background of the goal of sustainability.

Scenario workshops

Scenarios

Scenarios for facilitating learning processes among stakeholders have been most elaborately developed in the framework of constructive technology assessment, which is an approach that aims at broadening design, development, and implementation processes of new technologies (Parandian, 2012). The traditional use of scenarios can be extended to user- and citizen involvement. However, traditional scenario use takes a rather 'static' approach to processes of urban development, while especially in case of the implementation of new technologies a more 'dynamic' approach is desirable, in which stakeholders actively participate in the planning process. After all, the working of new technologies can only be assessed in actual practices – which, in turn, are predominantly the result of the interaction of different stakeholders in society. Scenario workshops can

be seen as a micro-cosmos in which these societal interactions are simulated, so that practices which would arise in societal reality are incorporated and accommodated in the workshop, which can lead to a more effective design, development, or implementation process.

The reasons for using scenarios, opposed to more traditional forms of forecasting, are that:

- The dynamics of various important factors are non-linear. It implies that small changes at specific moments lead to irreversible pathways in a development. For instance, as a famous urban legend claims, the width of current railway tracks is still determined by width of the classic Roman carriages.
- Not all changes are external: we create the world and we are not passive spectators. So our foresight partly depends on our own actions.

The consequence of the first reason named above might be to claim that the world is unpredictable. However, the same railway gauge example teaches us that there is quite a lot of predictability; the gauge has remained identical for centuries. Only there are 'forks' in history, not everybody might take the same direction at the forks, and how to foresee the consequences of the options? Scenarios might help to foresee the forks and the impacts of options.

In thinking about the future, it is useful to make a distinction between changes that are outside our reach (that are just happening, and we just need to adapt our plans to them) and the changes that we are creating by our plans. For both changes, we might use scenarios, but they are of a different nature:

- *External scenarios* span a 'future space' in which the plans that we make should be effective and efficient. Exploring this space makes sense in order to find (all) options open to the planner. Workshops on external scenarios lead to discussions regarding 'robust' options and precautions for 'the extreme'.
- *Internal scenarios* represent the main comprehensive strategies that could be implemented. These scenarios can be evaluated for their consistency, and lead to discussions regarding their 'success in meeting predetermined targets', and for their 'other impacts' under the various external scenarios.

So scenarios can figure as an important planning tool. But they might be more. Scenarios that present a comprehensive strategy might also create an interesting storyline that allows for a far better quality of interaction with, and between stakeholders. Often stakeholders have problems in imagining a consistent future: they often have immediate demands or problems to be solved, and it might be hard to make them think in a long term perspective. With that, it is hard for many actors to articulate the way they relate to a certain policy plan, which affects the efficacy of their contribution. In other words, the use of scenario's figures as a potential a tool for improving the quality of interaction with stakeholders.

With relation to choosing between technological alternatives, scenario workshops might be helpful because the interplay between competing sustainable technologies can be used as one of the narrative elements of the internal scenarios. This forces participants to go further than just supporting a specific technology, by making it necessary how this technology relates to the overall goal of sustainable development, as well as how it relates to other sustainable technologies.

Constructing storylines: Dilemmas and uncertainties

Although there is no fundamental reason to choose for a certain range of scenarios, the most convenient number is four, which allows a clear plotting on two axes and keeps the number of alternatives manageable. Moreover, a juxtaposition in a coordinate system helps to illustrate the antagonism that is pertained by certain policy choices – which, especially in relation to internal scenarios, can be seen as an important asset. One can represent different policy alternatives as *dilemmas* with which policymakers have to deal.

Subsequently, the main ingredients of the construction of the scenario storylines are given by the *uncertainties* that are at stake at a given sustainable alternative (Nekkers, 2012). The forks of future developments can be found in several domains of uncertainties, which include changes in the following domains:

- Demography
- Technology
- Culture
- Economy
- Politics/institutional contexts

Identification of uncertainties in these domains can be based on desk research, brain storm sessions, and participation of symposia and conferences, but particularly by expert interviews.

The juxtaposition of different storylines based on dilemmas shows that certain choices might create specific types of future dependencies between actors and technologies, that, in turn, might raise problems with respect to the overall goal of sustainable development. By showing these dependencies via scenario storylines, policymakers can be made more aware of the effects of their choices, also in relation to their sustainability ambitions. Moreover, the scenarios can be used as input for a discussion on stakeholders, so that also the relation of ambitions, interests, and outlooks of other affected actors can be taken into account.

In sum, the demands of sustainable development appear to be covered by the method of scenario workshops, which makes it a promising option for broadening the horizon of policymakers. At the same time, it has to be added, that this method of scenario workshops will not replace existing modes of policymaking. The basic contingency of the policy domain is still fully acknowledged, what a scenario workshop does is to enlarge the understanding of policymakers about the validity, acceptability, and as such the feasibility of a specific policy plan, in relation to the broader goal of sustainable development.

A simulated scenario workshop

The method of scenario workshops has been applied in a simulated form in the context of the CLUE-project, which is an Interreg-funded project in which eight European cities aim to develop climate neutral urban districts by exchanging best practices and by cooperating with three universities to apply state of the art monitoring methodologies – of which the scenario method approach is one. In March 2013, a workshop was held in Edinburgh, in which we presented and tested our scenario approach. The scenario workshop was attended by 25 participants: 15 policymakers from the different cities and 10 people from different universities. The scenario workshop that was held as a role play in which the case was based on the fictional Dutch city of Clueburgh.

External scenarios

The workshop was held in two rounds, one on external scenarios and one on internal scenarios. These external scenarios had been established on the identification of the main uncertainties. In the external scenarios, we focused on two elements that each relates to a combination of these factors. First, there is the future of energy, which predominantly pertains to economic, political, and technological factors. Second, there is the future of population pressures, which pertains to demographic, economic, and cultural factors.

Two axes were used to prepare the scenarios of this workshop. On the one axis, low energy pressure versus high energy pressure were represented. This axis related to pressure exerted by issues in the energy domain, such as availability of fuel, energy prices, the impact of CO₂-reduction policies, etc. The other axis represented low population pressures versus high population pressures. This second axis dealt with issues such as population growth or decline, immigration, aging, consumption patterns, etc. This juxtaposition led to the following four scenarios:

High energy-high population pressures

In this quadrant, both the issue of energy and population may lead to severe problems. For instance, climate change connected to increased CO₂-emissions may have direct observable consequences for cities (draughts or floods, urban heating, etc.), due to a shortage of both fossil and renewable resources, energy prices may have become so high that it threatens the economic and social stability in society. The severity of these problems may be increased by processes of urbanization, leading to crowded cities, which may also be caused by mass immigration due to the effects of climate change in poor countries.

High energy-low population pressures

Another possible future may be that the energy situation gives rise to serious crises, but do not lead to an increased pressure of agglomeration. For instance, because cities lose their capacity of attractive economic hubs, or that because of the decrease of birthrate and average increase of age, Europe becomes less populated.

Low energy-low population pressures

the production of unconventional fossil resources or the breakthrough of renewable energy systems might take away the current pressure caused by energy issues. Moreover, the demand for energy might decrease because of the fact that the peak of population growth, at least in Europe, lays behind us.

High energy-low population pressures

Despite the decrease of population size and socio-cultural dynamics, our patterns of energy consumption are not brought down, but still follow their upwards trend. The severity of the effects of climate change may lead to new, highly restrictive forms of legislation, demanding cities to drastically reduce their carbon footprint.

These external scenarios, which are probably the most familiar form of scenarios, have a rather instrumental function in the scenario workshop we propose. It is basically used to set the stage, to make participants realize that they all have their own specific outlooks, while other participants may have other ideas about the future.

Internal scenarios: dilemmas of technology

The core idea on which the construction of the internal scenarios is based is the juxtaposition of two dilemmas that can be associated with specific choices for certain sustainable technologies. The first dilemma is constituted by the opposition between developing an urban district by implementing a system based on renewables and developing such a district by increasing the efficiency of resource use. The essence of this dilemma is based on the conjecture that the investment of constructing a renewable energy system has to be retrieved, which takes away the incentive to become more energy-efficient. The second dilemma is constituted by the choice between using space as intensively as possible and the use of space as extensively as possible. On the one horn of this dilemma, we can find notions like that of the 'compact city', which propagates the clustering of activities and functionalities in order to increase the systemic efficiency. On the other horn of the dilemma, we can find ideas for instance about 'greening' the urban environment. The two dilemmas could be further plotted on two axes, as renewable systems can be expected to be associated with a condensed urban context, while a more extensive spatial orientation leaves more room for becoming more energy-efficient. For the further substantiation of the internal scenarios, the same set of uncertainties was used in order to construct the external scenarios. The different domains of uncertainties were used to identify developments that could be used as pivotal points in each of the scenario storylines.

Table one depicts these pivotal points for our four scenarios, which are based on the implementation of the following forms of sustainable urban development: geothermal heating, passive housing, compact city, and green city. The first column presents the fields of uncertainty, the second column give the uncertainties that pertain to all scenarios. The other four columns provide issues that are specific to a scenario. In the appendix, the full scenarios can be read. Furthermore, roles were allocated to the participants. The roles that had to be played related to a range of stakeholders that covered the relevant societal domains: local authorities, housing corporations, banks, residential organizations, and environmental NGOs. Furthermore, each of the scenarios was presented by one of the participants.

Findings and reflections

Upon the basis of a simulated workshop in which roles were played by policy makers and academicians, it is hard to come to real conclusions. This has also not been the ambition of this workshop, it was mainly used to test the format. Nevertheless, some general impressions can be made. First of these is that one may recognize the tendency of policy actors (who were in the workshop also played by policy actors) to come to a consensus standpoint. This hints at the propensity of group think. After the workshop, these actors found the lack of an solution-orientation a bit awkward, which basically tells that the aim to prevent group think is successful. It testifies that the people are forced to do something differently than they usually do (cf. Kahneman, 2011). Second, the divergence of stakeholders (even in spite of the real-life homogeneity of the participants) did open up the discussion to a considerable extent. New arguments, standpoints, and visions were raised during the debate. Especially the diverse ideas about what sustainability actually

means in relation to the project at hand became a topic of discussion. With that, it can be expected that the frame of reference for policymakers about sustainable developments can increase. However, it has to be acknowledged that the timeframe of 2,5 hours in addition to the unfamiliarity of some of the role players with their roles appears to be too short to really open up the solution space, as it is intended by the method of scenario workshops.

Scenario workshops promise to be an appropriate method to overcome some of the main problems of the policy domain related to the pursuit of sustainable development. This method allows to open up the solution space, it allows to include the perspectives of a range of stakeholders, and it allows to take future developments into account. Nevertheless, one also has to consider some of the potential shortcomings of the method. First, the method is very much oriented towards 'opening up' the decision-making process, but it should not be forgotten that the ultimate goal of the policy domain is to come to conclusive decisions. In other words, the process has to be 'closed down' as well (Stirling, 2006). Second, one may expect that a singular workshop is not sufficient to have an effective interaction between stakeholders. One of the main goals of a scenario workshop is to have 'mutual learning', however, such learning will, in all probability, demand several events in which stakeholders can exchange their world views, preferences, conditions, etc. With that, however, the threat of group think may recur: people who get to know each other, have the psychological tendency to seek for consensus. In sum, the promising method of scenario workshops, in the context of sustainable urban development, still requires a considerable amount of testing and fine-tuning.

Table 1: Main uncertainties in four axes on sustainable urban development

	General	Geothermal	Passive housing	Compact city	Green city
Demographic factors	1) Aging population lead to different patterns of heat consumption 2) Immigration changes dominant patterns of heat consumption			Ghettofication	
Technological factors		1) Chances are that drilling is unsuccessful 2) Contamination of (toxic) fluids 3) Drilling is still a technology with a high learning curve	1) Installation of balanced ventilation technology is difficult, in many ways it contradicts the ingrained patterns of installation technicians 2) New isolation techniques are still in development	Creation of new technological lock-ins, such as in the case of transport	
Cultural factors	It takes another way of dealing with heating		People use their living environments differently, due to working more at home	People may not want to live in a compact city, so that only lower social classes will come to live in it	
Economic factors	1) A low price of energy reduces the return of investment 2) Crisis in housing market threatens the economic viability	Not profitable, because of low energy consumption			
Political/institutional factors	1) Role of housing corporations 2) Balance between owners/renters of houses				
Users/residents		Fear of earthquakes	People like to let fresh air into the room		Parks may give the sense of unsafety for residents

Appendix

Clueburgh

Clueburgh is a city in the vicinity of Delft. It has 500.000 inhabitants. It aims to renovate one of its neighborhoods in a carbon-neutral way. Like any city, Clueburgh has to deal with a specific national context.

A first specific element of the Netherlands is the role of housing corporations, which are organizations that construct, manage, and rent affordable residences without making profit. These organizations are nowadays mostly private, their public assignment is guaranteed by governmental regulation and budget allocation. In the Netherlands, about 30% of houses are owned by housing corporations, in Clueburgh this percentage is about 40%.¹ Especially in neighborhoods in which lower social-economic classes live, most houses are owned by corporations. Since the 1990s the system of housing corporations has been subject to criticism.

- Many corporations extended their activities: they started investing in office buildings, educational buildings, event centers, etc. With that, managers of building corporations began to take large entrepreneurial risks, while most basically fulfilling a public function. Moreover, the salaries of these managers became higher and higher, raising a lot of public controversy.
- In its mission to make housing affordable, housing corporations do not take account of the income of tenants, which means that tenants are being subsidized to live in a cheap house, even if they could easily afford a more expensive house.

A second important element here is that private possession of houses is supported by government, and stimulated by having tax-deductible rents on mortgages. *De facto*, this means that people will pay more for a house than they would have been able to in a free market. In combination with the shortage of houses, and the limited opportunity to build houses in a condense country like the Netherlands, this led to a huge increase in prices of housing. Since the financial crisis of 2008, banks have been much more stringent in their granting of new mortgages, which led to a price fall of 19%. Making it very undesirable to buy a new house, 'locking' the housing market, even though the shortage of houses still exists.

The third element is that the Netherlands is one of most densely populated countries in Europe. Especially the central part of the Netherlands in which Clueburgh, like all major cities in the Netherlands (the so-called 'randstad'), can be found, is very populated, with a density of more than 1200 inhabitants per square kilometer. In this area, Clueburgh is the most densely populated city with almost 6000 inhabitants per square kilometer. One side of the city has the North Sea as its natural boundary. South of Clueburgh is the agricultural area of the 'Westland'. North of the city is natural area of woodlands and dunes. The Eastern boundary exists out of a highway, behind which other municipalities can be found. Earlier Clueburgh has appropriated land from some of these municipalities to construct a new residential area. Related to this issue of sparse space is that also in terms of car traffic, Clueburgh is a problematic case. Two highways basically end in the city center, after which there are only a few roads that have to accommodate all traffic, leading to huge problems in the domains of congestion, parking space, and air quality.

¹ <http://www.cbs.nl/nl-NL/menu/themas/bouwen-wonen/publicaties/artikelen/archief/2011/2011-3520-wm.htm>

Scenario 1: Clueburgh geothermal

In the early 2000s, geothermal heat had been introduced as a promising technology. The core of the Earth provides a constant flow of heat and by pumping up warm water from the subsurface, houses could be heated in a carbon-neutral way. Originally, it was also thought that geothermal heat could be used to provide green electricity, just by pumping water from such depths that its temperature would be over 300 degrees Celcius. 'Go Geothermal Energy' was an organization that had been established in 2002, which brought together experts and policymakers so to stimulate the development and implementation of geothermal energy.

In the greenhouse area of the Westland, close to Clueburgh, there had been some successful projects. Individual greenhouse owners had drilled a well to provide heat for their greenhouses. This helped to convince the municipality of Clueburgh that geothermal heat might also be a good source of urban heating, and as such helpful to reach the city's goal of being carbon neutral in 2050. In the Southwest part of Clueburgh, a residential area that had to be restructured was designated as a potential case for geothermal-based district heating. Another important occurrence here was that NEO, the company that provided heat to the city, had to invest in its boiler installations. NTO, a leading Dutch expertise organization, was asked to provide knowledge about the subsurface. Also the energycompany Conene was by the municipality of Clueburgh asked to join the project. Conene is an organization which showed great interest in sustainable development and moreover an organization of which a significant percentage of the shares were owned by the municipality of Clueburgh. A final set of partners that were asked to participate were three housing corporations, which owned most of the residences in the area to be restructured.

In 2010, a well was drilled and 3000 houses were connected to the geothermal net. Now 20 years later, we may say that the project has been relatively successful – although there have been severe financial setbacks. On a wider scale, geothermal energy never realized its initial promise: it has never become a widespread source of urban heating nor of electricity production.

To finance the project, a joint venture was made in 2008 between the municipality of Clueburgh, three housing corporations, NEO and Conene. With that, financial risks were spread along the partners. A business case was made to research the risks and benefits of the project, including such factors as heat demand, gas prices, costs of drilling, management of pumped water (which is often polluted). Although investigations showed that the risks were quite severe, and the price was much higher than initially expected (15 million Euro instead 6 million Euro) the rewarding of a European subsidy of 3,4 million Euro and the persuasive skills of the alderman who was driving the project, made it possible for all parties to join the project.

Initially, some residential resistance had to be overcome, as some tenants were unhappy with the drilling site in the middle of the city, and with the closing off of streets that was necessary to construct the heating infrastructure, but in the end, residents were successfully informed and convinced about the benefits of the project.

The drilling commenced in 2010. An exciting moment for the project owners, as the uncertainty of success is quite high. First, there is an 80 to 90% chance of pumping a warm water, which may be considerable for actors from the petrochemical industry, but which is

considered to be very risky for a public or a not-for-profit organization. Second, it is uncertain whether the temperature of the water that is pumped up is high enough for the project. Third, it is uncertain which kind of dangerous materials are brought to the surface, such as gas, arsenic, radioactivity, etc. Fortunately, the well, that was drilled at 2300 meter deep, proved to be successful in all respects.

At the same time, the banking crisis of 2008 led to a deep crisis in the Dutch housing market. This implied for the project that a huge amount of the envisioned houses that had to be connected to the system would not be build. Instead of 6000 houses, only 3000 houses would now be heated by geothermal energy. The contracts that were closed between the six parties obliged the housing corporations to buy a fixed amount of geothermal heat, however, with the reduction of houses, it proved to be impossible for the housing corporations to fulfill the aspired demand, leading to sincere fines. In all, each year the corporations lost millions of Euros on the project.

It was far from the only problem that the housing corporations were confronted with. The bubble in the housing market of the early 2000s led to risky forms of entrepreneurship and overconfident management. In the 2010s, the big housing corporations came in deep financial trouble. The housing crisis was not only propelled by the housing corporations, but also by the tax deductible mortgage rents. The system proved to be untenable. The tax deduction of mortgage rents was fully abolished halfway the 2010s, and the housing corporations were collectivized again. The three corporations that participated in the geothermal project were taken over by Clueburgh, which had to take a huge financial loss.

The mission of the now municipal housing corporation was to provide affordable houses only for the lowest social-economic classes. Most residences were sold to tenants and private owners. The bulk of houses, however, because buying a house came of be out of reach for most people, were bought by market parties, which now asked rents that were in line with market prices. The municipality kept possession of most houses in the geothermal district. Houses were quite small and not that attractive to well-off people. Despite all attempts to make the housing market dynamic again, people who lived in this area kept living there, basically for the rest of their lives.

Following the American success in the production of shale gas and shale oil, European countries like also invested heavily in this fossil fuel. The new flood of cheap oil and gas, led to a steep decline in energy prices, which produced an additional financial setback to the project. In the end, the project never led to any financial gain. Clueburgh and the two energy organizations simply had to take their financial losses.

On a larger scale, geothermal energy was never applied widely in the Netherlands. The enthusiasm for extracting warmth from the subsurface had been diminished since the increased number of (minor) earthquakes in areas that had been subjected to gas and oil mining. Licenses for new sites became very hard to acquire. Public resistance against drilling projects was massive. The costs of drilling also remained to be very high, over 10 million Euros for a system that has many inherent uncertainties, and discouraged most potential investors.

Moreover, passive housing has come to be the standard for newly build and renovated houses. The Energy Performance of Buildings Directive of the European Union that was passed in 2009, imposed that all new houses had to be nearly zero energy from 2018 onwards.² Construction companies, project developers, municipalities came to be accustomed with passive housing. Though the European Directive meant that renewable heating systems are allowed, there simply is no need any longer to invest in such systems.

² <http://www.pass-net.net/why/index.htm>

Passive houses are cheaper to build, their functioning is proven, and people know how to construct them and how to live in them.

At the same time, the residents using geothermal heat are quite happy with the system. People that live in the residential area are now usually quite aged, they liked their rooms to be a few degrees than average. Geothermal heating allows raising the thermostat with only a mild financial penalty – also the municipality of Clueburgh is happy with some additional heat consumption in order to at least earn back some investment costs. Moreover, the provision of cheap heating provided by a radiator gave people the sense of old-fashioned warmth, instead of having a constant flow of air with an even temperature. Nevertheless, in a couple of years, when the houses have to be reconstructed, or in most cases, torn down, the geothermal system will be ended. The new and the renovated houses, like most houses will become passive.

Scenario 2: Passive Clueburgh

The Tasman Quarter is a residential area in Clueburgh that has been constructed in the early 2010s. With the application of passive housing, the municipality of Clueburgh tried to contribute to its goal of being carbon neutral in 2050. Moreover, the municipality was well aware that in 2018, all newly build houses would have to be nearly zero, which basically meant that for the construction of most new buildings, passive housing would be the obvious choice, as not all buildings cannot be easily connected to the infrastructures that are necessary in case of renewable energy provision.

A passive house means that buildings will only consume 15 kwh/m² per year. They do so by having very good isolation and for instance by having a balanced air circulation system and a ground heat exchanger. Biomass and solar panels may also be used to provide energy. In terms of heating, a passive house will only have a demand for warm water, there is no additional demand for heating the building itself. Even in 2010, the concept of passive housing was not very challenging in terms of technology. It basically integrates existing technologies, of which the functioning had been proven.

The Tasman Quarter was aimed at the high end of the market, most notably for well-off people that wanted to live in a 'green' way. The project was instigated by one of the largest project developers in the Netherlands, Stalladam. Although being a very experienced company, the Tasman quarter was the first passive housing project that it constructed. Also outside Clueburgh there was not much experience with passive building. At that time, certification and standards were simply lacking, which meant that Stalladam did not have much guidance to go by – which unfortunately showed in the construction of the residential area.

The crisis in the housing market led to budget costs and hiring inexperienced subcontractors. The first thing to go were the sunscreens on the façade of the houses. In the Netherlands, sunscreens are not standard on a house, so the contractor thought it no problem to not apply them. Obviously, the installation of a balanced ventilation system requires a certain level of understanding of how the system works. The installation crew however did not have this expertise. For instance, the tubing has to have a minimum of bends in order to function well. However, the availability of flexible (ribbed) tubes was taken as making it very easy to install the tubing system, enabling a lot of twists and bends without much difficulty.

The new system was unfamiliar not only for construction workers, but also for the new residents, who, in spite of all their environmental friendliness, had some problems with their new houses. Some of these were the result of wrong construction. A first problem was noise. The tubing system buzzed, driving some residents mad. Some of them even cut the wiring, just to get rid of the noise. A second problem was the excessive indoor heat, because of the lack of sunscreens. A more severe problem was caused by bad ventilation. The insufficient circulation of fresh air led to a lot of complaints about headaches and nausea among the residents.

Some houses were put on sale, but given the crisis in the housing market and the bad press the neighborhood received, it is no surprise that there was not a lot of interest in buying a house in the Tasman Quarter – giving rise to even more chagrin. Others residents simply installed windows that could be opened. Another problem was that people started to use their house differently than expected. People who bought houses in the Tasman quarter often worked from home, office workers, a possibility created by the internet. Often they worked from their bedroom, which however, was subjected to another climate regime as the living rooms. In other words, it was not really comfortable to work in your bedroom.

A number of home owners started an association, *Activepassive ownership*, that went to court to compel Stelladam to repair the shortcomings of their houses. The defense of Stelladam was that there is no certification of passive houses, so that the company was not liable: there are different understandings of what a passive houses exactly is, the understanding of Stelladam had not been better or worse than the understanding of the home owners. Despite this defense, the judge granted the complaint of the home owners. He said that Stelladam sold its houses as passive, and that it should have known better what this concept implied. Stelladam had to repair the shortcomings. The downside of this development was that it discouraged Stelladam and other building companies to invest in new passive houses. The upside was that it led to national certification and quality control. With that, there were less new passive districts, but the district that were build did satisfy the norms of passive houses.

The uptake of passive houses was also slowed down by the decrease of fossil fuel prices, which was caused by the availability of oil from the arctic, tarsand, an shale. The decrease of prices of fossil fuel also led to a renegotiation of the Member States on the Energy Performance of Buildings Directive. One of the arguments that was given by the Netherlands, one of the strongest opponents of the new directive, was that the directive would obstruct the economic resurrection of the building sector. More cynically, it has been claimed that the cheap prices of oil took away the sense of urgency to make the transition towards a carbon neutral energy system. Moreover, the Netherlands had been slow in its uptake of renewable forms of energy. The end result of the renegotiations was that the directive would only be implemented 5 years later, at the same time the stringency of the norms was considerably diminished.

In 2010, passive housing was introduced as a big promise. 20 years later, we may say that this status has stayed the same. It still is very much a promise, as we are still waiting for the previously expected rise in energy prices to happen. In the meantime, people in the Tasman Quarter are very happy with their houses. The absence of radiators allows them to have more spacious houses. The architecture remains state of the art, even 30 years later. After the long dip in house prices, the market has been restored since the late 2010s. The houses in the Tasman Quarter nowadays belong the most desirable real-estate in the Clueburgh area.

Scenario 3: Compact Clueburgh

Different problems in the early 2000s challenged the municipality of Clueburgh. First of these was the burden caused by car traffic. Not only congestion was a problem, also the air quality was very bad. After a monitoring system was installed, one street in Clueburgh acquired the label 'dirtiest street in the Netherlands due to the high concentration of particulate matter. This relatively small street basically was an extension of a highway, and as such obstructed the flow of traffic immensely. Given the height of the buildings, exhaustion gasses had nowhere to go. At the same time, the area in which this street lies, the *Purgedistrict*, was highly impoverished, landlords offered cheap, but lousy, housing, which were especially inhabited by poor immigrants.

An integral plan was made that tackled traffic, and that created public and cultural facilities, as well as interesting architecture. In this way, the municipality hoped to break down the downward spiral of ghettoization. By attracting people with an interest in culture, such as artists and young professionals who worked in the city, and as such were not dependent on cars, Clueburgh aimed to revive the Purgedistrict. Moreover, the city aimed to make the district as environmentally friendly as possible as well by having a 'green' sewerage system and by using carbon-neutral energy, most notably by installing PV-panels, and by developing a biobased district heating system.

The masterplan consisted of the following elements. First, the central square of the district was to be restructured, by building a new city hall, a museum for modern art, and a new theater that would come in the place of a cinema, a dance theater, and a music hall. Second, blocks of houses had to be purchased in order to be renovated or rebuilt. Third, the traffic infrastructure was dramatically altered. Large sections of the district were closed off for cars, and only accessible for buses and bikes. Other traffic was redirected via a 'traffic circulation plan', which concerned the development of a ring road around the city center so that traffic would not drive straight into the city any longer. In order to further public transport, a plan was made to construct a tunnel for trams. Obviously, the realization of this plan would take a long time and a lot of money, but on the other hand, it would make the center of Clueburgh a highly attractive area, combining all the benefits of city life, without its disadvantages.

The restructuring of the central square started with the construction of a new city hall. This new building included the state of the art-technology to deal with its energy challenges. On the roof a large collection of PV-panels was constructed, and the heating was provided by the district heating system. The museum, which was established in the old city hall, was also connected to these energy systems. Both buildings were seen as big successes. The construction of the new theatre, however, was subject to many problems. First, the construction of a new theater led to public resistance, as the existing theaters that could already be found at the square were only a few decades old. Local residents accused the municipality of squandering money. The city council still agreed with the construction, one of the arguments being that such construction was necessary to support the building sector, who were in big economic trouble because of the financial crisis. A condition that the city council posed was that construction workers had to be unemployed workforces from the Clueburgh area. Another consequence of the financial crisis was that the budget had to be reduced, which meant that some of the most challenging assets had to be given up. The aspiration to have a carbon-neutral building was one of these. In the end, the theater became a rather conventional building, which nevertheless took a long and difficult time to construct. Fraudulent practices among contractors were manifold, most notably in relation to the hiring of unemployed workforces, for instance, lists of non-existing people were used. The unmasking of such practices in the media led to even more

resentment of the local population. Nowadays the theatre is finished, still there are problems such as leakage and a lack of appeal.

The revival of the residences in the Purgedistrict was done in several phases. Houses were bought of landlords who were neglecting their property, in many cases their tenants were illegal immigrants living in bad circumstances. Quite some hemp plantations at attics and cellars were found. Other residences were owned by housing corporations, with whom the municipality could make agreements and covenants. The general idea of the restructured district was to diversify the area. Some blocks would be demolished, some would be renovated. There would be a lot of space for galleries and small shops, as well as for ateliers. Some blocks would be sold cheaply to people who were given the opportunity to fully design their own interiors. The reconstruction of the energy and water infrastructure was in the hands of the municipality.

It was not the idea to evict people from their houses, apart from illegal immigrants. First, that was not necessary, as there was quite a high degree of vacancy. Moreover, it was thought that the coming of new, open-minded, people would contribute significantly to the socio-economic integration of immigrants.

Nowadays, in 2030, we are well aware that in terms of integration, the Purgedistrict cannot be considered a huge success. Although there is no friction between different groups, a clear watershed between different societal segments can be observed. On the one hand, there are the rich professionals, generally well-educated, who work as artists, civil servants, consultants, etc. They usually have a Dutch background. On the other hand, there are the second, third, and sometimes even fourth generation immigrants. In general, their economic position and their education is low. Both groups appear to be quite satisfied with living in the Purgedistrict, even though their disposition towards their habitat is completely different.

For the rich professionals, living in the Purgedistrict means living close to their job, close to cultural facilities, and living amongst many of their peers. Their children go to so-called 'white schools', which are surprisingly homogeneous, given the multi-cultural character of the district. These young professionals often see themselves as 'green', and they are proud to make use of the environmentally friendly facilities that are offered to them. Then again, it has to be admitted that their ecological footprint is far from small. The one thing they miss in their neighborhood, space, can be easily found elsewhere. Many families have a second house outside of the city, these homes are usually not connected to carbon-neutral energy networks, and they often consume quite a lot of space. Moreover, the young professionals are used to having quite a number holidays every year, some of lasting only a couple of days. Such holidays include, almost without exception, travel by plane.

The inhabitants of Purgedistrict who have a foreign background do not have a lot of interest in being environmentally friendly. Most people are still very much relying on their cars. In fact, if there has been any kind of friction in the Purgedistrict between different groups of residents, it is due to having people park their cars outside parking spaces. Also in adjacent residential areas, there have been protests against people from Purgedistrict parking their cars over there. Children who have immigrant ancestors go to so-called 'black schools', which obstructs the integration of children from different backgrounds, as well as obstructs the integration of their parents. The reason for this segregation of schools lies in the law on free schools in the Netherlands, that prevents governmental interference in school policies. It is simply prohibited to distribute children to certain schools. Another issue is that people with a foreign background have different patterns of energy consumption. There appears to be at least some credibility in the stereotypical descriptions that these people like to have big flatscreen television sets, and they like to

have their homes a few degrees warmer than Dutch people. There have been quite a lot of people for whom the district heating system just does not give enough warmth. To solve this problem, they used electric heaters, so that the net electricity demand of the Purgedistrict vastly exceeded the supply by carbon-neutral sources. Nevertheless, if one would calculate the respective ecological footprints of the two groups of residents, it is not completely evident whose footprint would be the largest.

The third element of the Purgedistrict masterplan was the reduction of traffic and the stimulation of public transport. The traffic circulation plan meant a great reduction of car traffic in the district. Air quality was sincerely improved and congestion was very much limited (or displaced to other locations). This made it safe and comfortable to use bicycles, which a lot of people came to do, especially among the young professionals. As said, the use of cars remains to be common among people with a foreign background, sometimes leading to frustration about the lack of parking space on the one hand, or the occupation of space by cars on the other hand.

The public transport system has been an expensive one to construct, especially in case of the tram tunnel. The costs of the construction were twice as high as planned, and the realization of the tunnel took four years more than was scheduled. The tunnel was plagued by subsidence and severe leakage. However, nowadays the consensus is that the tunnel is aesthetically attractive as well as functioning satisfactorily.

A problem that only emerged in the late 2020s is the rise of clean and smart car traffic. Electric cars that are now able to 'communicate with each other' promise to make individual traffic available without the shortcomings of pollution and congestion. More and more, we see that people who are well-off buy cars that are smart and green. Making car use attractive again, even for environmentally friendly people. The question is what will happen to Purgedistrict when young professionals lose their interest in living there, because their cars cannot be parked over there. It may be that the district becomes an area again troubled by petrol-fueled old-fashioned cars, the only ones that can be afforded by the people who cannot easily leave the neighborhood.

Scenario 4: Green Clueburgh

For years, Clueburgh wanted to build in the dune and woodlands area in the Northern part of the city. Environmental groups always obstructed the realization of these plans. Around 2010, Clueburgh decided to change its strategy. Instead of fighting with the environmental organizations, it realized it might be more sensible to work together. The municipality started to organize meetings in order to find out under which conditions would it be possible to build residences in the dune and woodland area. Architects and urban planners were invited to think about approaches that could harmonize the standpoints on urban development and ecology.

A number of binding principles were formulated and signed by all parties involved and gave rise to the design of a district that should grow out to be the standard of reconciliation of ecology and urban planning, which would be given the name of *Sandytown*. A first condition was that the district should be carbon-neutral in terms of energy. Second, the natural surroundings would have to be protected, and open space and forest should be respected as much as possible. Third, the visual impact of houses had to be minimal, and as much as possible in line with nature. Fourth, the district should not become only affordable for rich people. Finally, the design of the district would be done by the continuous engagement of environmental organizations.

Not all environmental organizations joined the process, while the *Natural Conservation Foundation*, the largest environmental NGO in the Netherlands, fully cooperated with the municipality of Clueburgh, *Ecodefense* did not want to participate in the process. But as Ecodefense was a much smaller organization than the Natural Conservation Foundation, Clueburgh was not much discomforted with this.

The final design was one in which larger and smaller houses were blended in the natural environment. With that, the aesthetic challenge was achieved. Other elements of the design however proved to be much harder to realize. In many respects, the conditions that had been set up in the beginning of the process led to difficult questions.

For instance, how would people get to their houses? Parking space would be regarded as visually obtrusive. Buses and trams were also not acceptable, and digging a tunnel would be too disruptive for nature. For the more expensive residences, underground garages could be constructed. However, for the cheaper residences a number of larger parking spaces at the outskirts of the district were considered to be the most preferable option. Parking near the house was only for loading and unloading. It was expected that the people that wanted to live in such a natural environment would not mind walking a bit from their car to their house. Unfortunately, they did. Not just because people did not want to, however, many women felt quite unsafe walking home, especially after dark. In 2018, rumors about a rapist in the district led to the common practice that residents parked their cars next to their houses. That meant that they destroyed the underground, so in the end, the municipality had to make paved parking spaces.

The second big issue concerned the production of energy. Where to get the carbon-neutral energy? The Netherlands has limited ways to produce renewable forms of energy, wind and solar power are basically the only viable options. The Clueburgh municipality pushed the wind energy option, which implied the construction of wind turbines. At that time, wind turbines were subject to controversy. They were thought to spoil the landscape and they were claimed to kill many birds. Obviously, this meant that they could not be erected in the vicinity of Sandytown. The Natural Conservation Foundation was willing to have wind turbines elsewhere: a few kilometers to the west of Sandytown was a polder that was very suitable for having turbines, and it was thought that the visual appeal of that location was not negatively affected by these turbines. Ecodefense thought differently and went to court. Eventually, the Supreme Court found that Clueburgh contradicted its own appointments about the minimization of visual impact of the project, and prohibited the construction of wind turbines.

This meant that another source of carbon-neutral energy would have to be found. As the installation of PV-panels was also considered to have negative visual impact, the only solution that could be thought of was the import of green energy certificates from abroad. The problem of such import is that it is merely a paper transaction, the energy that is actually used is still fossil-based, but by buying certificates it is made sure that somewhere else green energy is used. This practice of green energy certificates has become quite controversial, and as more recent research has shown, it does not contribute significantly to the reduction of the use of fossil fuels.

These events led to negative media coverage, affecting the legitimacy of Sandytown as a project. It also led to a loss of credibility of the Natural Conservation Foundation. Many people thought that this organization had been compromised by participating in a project that was bound to fail from an environmental point of view. These people agreed with Ecodefense that of Sandytown is that a valuable natural area has been sacrificed for residential development. People living in Sandytown however are still very much satisfied with their neighborhood. The environment and the architecture is found to be attractive.

As an effect, the prices of houses have risen considerably. Even the residences that were meant to be affordable are now out of reach for most people.

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Exploring the transformative potential of communities

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Abstract

This discussion paper engages with the transformative potential of communities, meaning the potential of communities to transform themselves and their surroundings so as to address persistent problems (i.e. societal challenges) and to contribute to a sustainability transition. Through a review of sustainability transitions and social innovation literature as well as two case studies of transition management in local communities we explore this concept further and propose six elements that make up the transformative potential of communities, namely: 1) a shared and acted-upon perspective on the present and a desired future which integrates diversity; 2) (inclusive) networks across actor categories, domains and levels, 3) a learning environment, based upon experimentation and/or reflexivity and accompanied by empowerment, 4) needs of the community are met now and in the future, 5) alterable social relations in an environment of participation and direct action, and 6) access to resources (e.g. money, time, power, networks, political will).

Introduction

The field of sustainability transitions has to date focused on policy domains such as energy or water (e.g. Grin et al. 2010, Markard et al. 2012) and to a lesser extent on regional or urban development. This also holds for the field of transition governance, where transition management (Loorbach 2010, 2007) has mainly been applied and researched on a sectoral level (Zijlstra & Avelino 2012, Frantzeskaki et al. 2012, Verbong & Loorbach 2012). As part of a three year European research project, InContext, the transition management approach was contextualized for use in local communities. InContext not only had the aim to better understand the contexts that influence the ability of individuals and local communities to deal with societal challenges but also to facilitate processes that enhance their transformative potential. For this reason an action research approach was chosen which followed the so-called community arena methodology which is based on insights from transition management, backcasting and social psychology (Wittmayer et al. 2011).

This discussion paper focuses on the outcomes of three years of action research employing the community arena methodology in three communities in Austria, Germany and the Netherlands. It has a twofold aim: a) to explore an understanding of a transformative potential of communities from a transitions perspective and b) to address the extent to which and how the transformative potential of communities in addressing societal challenges and persistent problems can be enhanced.

Doing so, the paper is structured as follows. First we establish an understanding of the transformative potential of communities as an analytical frame. Secondly, we outline two cases of transition management at a community level aimed at enhancing this potential. Based on these cases, the discussion explores how transformative potential of communities can be understood and enhanced by adopting a transition (management) perspective.

Transformative potential of communities: Drawing up an analytical frame

Before analysing two cases of action research employing the community arena methodology, we draw on literature of sustainability transitions as well as of social innovation to establish an analytical frame regarding the transformative potential of communities.

Sustainability transitions, as defined by Grin et al. (2010: 1) are “radical transformation towards a sustainable society as a response to a number of persistent problems confronting contemporary modern societies”. In taking this perspective, scientists have to date mainly be looking at transitions in sectors (e.g. water, energy) to the detriment of fundamental changes on more local level, such as e.g. in communities in neighbourhoods or villages. By focusing on the latter in the context of persistent problems and societal challenges, one of the questions that arises is whether communities have the potential to transform themselves (community transformation) and their surroundings (system transformation) so as to address these problems and become more sustainable. This relates to questions of agency, which in the sustainability transitions literature is mainly dealt with under the denominator of ‘transition management’ (Loorbach 2010, Grin et al. 2010). Transition management is studying ways (and translating them in governance prescriptions) in which transitions can be influenced so as to contribute to sustainable development. It is based on a number of principles, which are derived from complexity theory, governance and sociology (Loorbach 2007, 2010). To name a few: long-term thinking as the basis for short term policy, thinking in terms of multiple domains (multi-domain), different actors (multi-actor), different levels (multi-level), learning as an important aim for policy (‘learning-by-doing’ and ‘doing-by-learning’) orient governance towards system innovation besides system improvement, keeping options open, and exploring multiple pathways (Loorbach 2010, 2007). In revisiting these, we can formulate a number of elements composing the transformative potential of communities based on a sustainability transitions perspective, namely:

- a shared perspective of the present and the future (i.e. a vision of a sustainable future)
- a diversity of perspectives with regards to pathways
- an attitude connecting short term actions and long term vision
- (inclusive) networks across actor categories, domains and levels
- an environment that is supportive of learning, experimentation and reflexivity

While the transition management perspective is marked by a linkage of innovation and sustainability (Frantzeskaki et al. 2012), it is also rooted in the field of socio-technical innovation and functional systems (e.g. sectors) (Grin et al. 2010). Turning to the field of social innovation can counterbalance this focus and account for more social aspects as well as the local level (Moulaert et al. 2005, 2010). These authors stress three dimensions of social innovation, which are 1) the satisfaction of human needs (content/product dimension), 2) changes in social relations, especially with regard to governance and participation (process dimension) and 3) increasing the socio-political capability and

access to resources needed to satisfy needs and participation (empowerment dimension). These can be translated into elements of a transformative potential of communities in the context of sustainability transitions, namely:

- needs of the community are met now and in the future,
- alterable social relations in an environment of participation and direct action,
- access to resources (e.g. money, time, power, networks, political will),
- an emphasis on empowerment and learning.

These nine elements taken together describe characteristics of a community with transformative potential in the context of sustainability transitions: the potential of communities to transform themselves and their surroundings

Case Studies

Having established an understanding of what we mean by transformative potential of communities, we now turn to an in depth description of two case studies, namely Rotterdam Carnisse, and Finkenstein. After having outlined the research context we outline for each case study first the local context, followed by the implementation of the community arena process and the outcomes thereof. Doing so we focus on elements that might help us to better understand the transformative potential of these communities and how this can be enhanced.

Research context

InContext is a three-year EU-financed FP7 research project aimed at identifying the framework conditions that enable a societal transition towards an ecologically sound, economically successful and culturally diverse future locally. In doing so, the project developed and applied innovative methods for dealing with societal challenges. The quest of InContext in supporting sustainability transitions in local communities was twofold: First to better understand how factors internal to the actors, at individual and group level, interrelate with their external context (within InContext this was referred to as the inner and outer context of behaviour). Second, it aimed to understand how the transformative potentials of local communities could be unleashed.

Table 1: Overview of the Community Arena methodology (underlined are the participatory meetings)
(Source: Wittmayer et al. 2011)

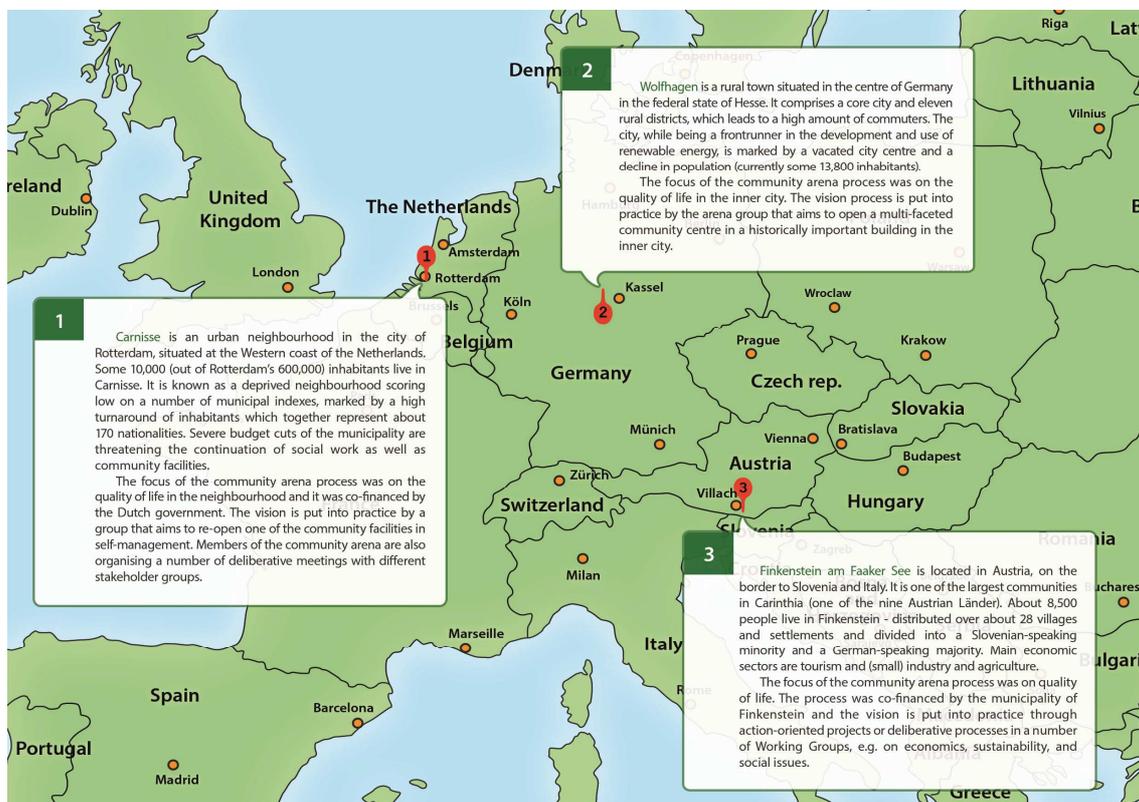
Phases of the Community Arena		
	Key activities	Key output
0. Pre-preparation	A. Case orientation B. Transition team formation	A. Initial case description for each pilot B. Transition team
1. Preparation & Exploration	A. Process design B. System analysis C. Actor analysis (long-list and short-list of relevant actors) incl. interviews D Set up Monitoring framework	A. Community Arena process plan B. Insightful overview of major issues/tensions to focus on C. Actor identification and categorisation + insight inner context D Monitoring framework
2. Problem structuring & Envisioning	A. Community Arena formation B. <u>Participatory problem structuring</u> C. Selection of key priorities D. <u>Participatory vision building</u>	A. Frontrunner network B. Individual and shared problem perceptions & change topics C. Guiding sustainability principles D. Individual and shared visions
3. Backcasting, Pathways & Agenda Building	A. <u>Participatory backcasting</u> & definition of transition paths B. <u>Formulation agenda and specific activities</u> C. Monitoring interviews	A. Backcasting analysis & transition paths B. Transition agenda and formation of possible sub-groups C. Learning & process feedback
4. Experimenting & Implementing	A. Dissemination of visions, pathways and agenda B. Coalition forming & broadening the network C. Conducting experiments	A. Broader public awareness & extended involvement B. Change agents network & experiment portfolio C. Learning & implementation
5. Monitoring & Evaluation	A. Participatory evaluation of method, content and process* B. Monitoring interviews	A. Adapted methodological framework, strategy and lessons learned for local and EU-level governance B. Insight in drivers and barriers for sustainable behaviour

To address these questions, an action research methodology (referred to as the community arena methodology) integrating insights from transition management, backcasting and social psychology was developed and implemented in three communities (Wittmayer et al. 2011). The community arena process is a co-creation process where the tacit knowledge of engaged citizens is integrated with the scientific and process knowledge of researchers and experts to result in a long-term sustainability vision and agenda, as well as in immediate action within the community in question. By reflecting on the process and its outcomes, new methodological and theoretical insights have been gained. The aim was threefold, 1) to learn about the InContext quest, 2) to lead to reflection processes at the individual and group levels allowing for the emergence of new more sustainable strategies, as well as experiments with innovative practices as alternatives to established ones and 3) to gain theoretical and methodological insights into an iterative process.

The community arena methodology (as outlined in Table 1, Wittmayer et al. 2011) was implemented in three European communities (see Figure 1). Like in other TM processes, here we also refer to geographical markers: Rather than starting from the concept of a community that is defined by shared values and experiences, we focused on 'spatialised' communities and their administrative boundaries. It is implemented by a transition team consisting of the InContext action researchers and locally relevant persons. This team not

only prepares, documents, analyses, monitors, co-ordinates, manages, facilitates and evaluates the whole process, but also selects participants. It brings together the various parties, is responsible for internal and external communication, acts as intermediary in discordant situations and has an overview of all the activities in and between arena meetings. After having done some preliminary analysis, the transition team brings some 15 people of the local community together for a participatory, searching and learning co-creation process. These change agents hold divergent worldviews and are brought together to meet several times in the community arena setting. Throughout this deliberative process, the change agents discuss the current status quo (what is the problem and what are the current sustainability challenges?), envision a sustainable future in about 30-50 years from now and then follow a backcasting methodology to come up with pathways and milestones. The process results in a change narrative and immediate action points, the transition agenda. Subsequently the agenda is put into practice through a number of experiments or projects.

Figure 1: Overview of InContext pilot projects (Source: Wittmayer et al. 2013a).



Case 1: Rotterdam Carnisse, The Netherlands

Local Context

Carnisse is a neighbourhood of the harbour city Rotterdam, the Netherlands. In 2007, Carnisse (as part of Rotterdam South) was listed as one of the 40 neighbourhoods nationwide that the national government labelled as ‘neighbourhoods of extra interest’ (‘aandachtswijken’). These neighbourhoods are all seen as having problems in multiple domains (social, physical and economic) and receive special attention and funds from the national government.

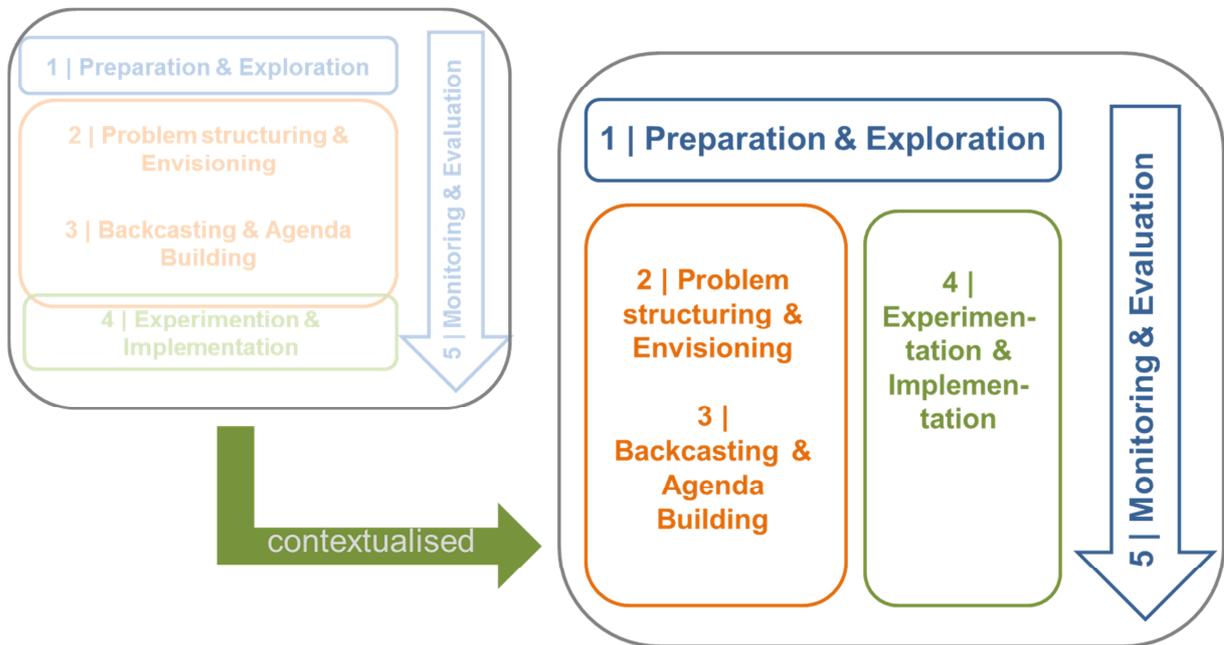
The context of Carnisse in 2011 was strongly influenced by the current economic crisis, which led to huge government budget cuts and a withdrawal of the welfare-state. Although old welfare structures were being dismantled, there remained a high level of (non-) governmental activity, as well as a long history of local participatory processes and interventions by professionals and/or researchers. The inhabitants of Carnisse who took part in the Community Arena process (either through interviews or as arena participants) expressed their frustration with the above, but were also eager to relativize the picture of a deprived neighbourhood by pointing to the many initiatives that were arising from within the community..

Process

The Community Arena process started in August 2011. In the period until February 2012, the transition team was doing the system and actor analysis (including interviews, attending meetings, getting acquainted with the locality), which led to a selection of potential participants for the arena process, as well as a problem description based on interviews, observations and secondary data. On the basis of the system analysis, which also pointed to a weariness of participatory processes in the neighbourhood, the final process design was informed by a meeting with five frontrunners from Carnisse in November 2011 (a 'pre-arena meeting'). This resulted in an adjusted process design: deliberative participatory meetings (as suggested by the methodology in phases 2 and 3) and a more action- and implementation-oriented experiment (as originally suggested in phase 4) were started simultaneously in February 2012 (see Figure 2).

During the first meeting, held in February 2012, the problem analysis (i.e. system analysis) was presented and the main topics of interests were identified through a group discussion: powerful/-less policy, rich and turbulent history, government cuts, diversity, connections, and the maintenance of housing. In the two following meetings in March and April 2012, participants explored their needs with regard to the community centre (the focus of the action-oriented trajectory) and drew up a vision for the neighbourhood in 2030 in which the community centre plays an important role. The vision is called 'Blossoming Carnisse' and includes the following topics: 1) ...to living with each other, 2) ...to a green sustainable oasis, 3) ...to diverse housing styles, 4) ...to places for everybody, and 5) ...to working together for blossoming. In May 2012, a fourth Community Arena meeting was held with a focus on backcasting and developing pathways from the future vision back to the present. After having discussed and reached an agreement on the vision, three small groups worked on exploring pathways for the six topics of the vision. These were, together with activities that already took place, described in the final vision document. In November 2012, the vision was presented to a broader audience in the neighbourhood during an official community forum organized by the district municipality of Charlois where the vision was put on the agenda and attracted twice as many attendants as other community forum evenings.

Figure 2: Contextualisation of the Community Arena Methodology for Carnisse (Source: Wittmayer et al. 2013b)



As outlined earlier, a more practice-centred process was started in parallel with the deliberative meetings of the Community Arena (see Figure 2). The community centre, which ultimately closed in January 2012 due to the bankruptcy of the welfare-organization running it, served as a clear symbol for the changing landscape and context of Carnisse (budget cuts, the dismantling of old welfare structures and a lack of social cohesion). It was the object of four meetings that took place in February and March 2012 where a local action group was formed to work on its re-opening. Afterwards, the core of the local action group stayed in contact through Email and telephone, and worked on a number of strategies. It drew up a business plan, reached more than 300 people through a petition and lobbied different representatives of the sub-municipality, the welfare organization and the larger municipality. When the group felt that they could take it over themselves, the researchers withdrew from the process after two more broad meetings. Currently the foundation, supported by the professional, is managing the community centre, fulfilling all daily tasks through volunteer work from the board members and continuing the dialogue with the municipality. The latter has accepted ownership of the building and is now in the phase of negotiating the rental sum with the foundation.

In February 2013, an evaluation meeting took place where the participants evaluated the process and the outcomes and formulated future ambitions.

Outcome

In this section we look into the dynamics within the groups that were formed through the process, as well as their relation to the political and wider societal context, before considering empowerment and learning as aspects of such processes. In Carnisse, we can distinguish between the community arena process and the experiment focusing on reopening the community centre. The latter shows clear signs of leadership. In the course of a one-year process, a group of three women emerged and established a foundation,

which is now formally responsible for operating the community centre. However, the community arena itself formally ceased to exist after the facilitated meetings. There were no attempts by the participants to keep this structure alive through regular formal meetings.

With regard to the political context, the community and policy makers are rather tired of participatory processes. These processes are mainly initiated by the municipality and are meant to inform rather than to consult or to involve the public. Previous participation processes were often seen as being unsuccessful or at least judged critically by residents. Recent municipal budget cuts increased these sentiments. Therefore, the pilot process was eyed with suspicion because both local policy makers and inhabitants of Carnisse were sceptical of whether the arena process could deliver the concrete results they were seeking. In this context, the community arena methodology was perceived as unique by the participants: a process with an open agenda that was to be set by the participants and was not initiated by the municipality. The local municipality, on the other hand, perceived the openness of the arena process as problematic; especially that it could not be controlled in terms of output and outcome. Overall, because of the weariness of previous participatory trajectories and other projects, there was a low level of trust between the different parties involved. The participants could not all adapt to this new form of participation and at times fell into the roles which they were accustomed to from previous municipality-led participatory processes. The participants, for example, saw the realisation of the vision as being closely connected to actors from policy, business or housing. Some participants put these actors in the driver's seat in hope that the municipality, district municipality, housing corporations or similar actors release funds for investments in Carnisse so as to realize the vision of 'Blossoming Carnisse'.

In Carnisse, the relationship between the transition team and local decision makers ranged from disinterest to rejection because of the interplay between transition activities and political decisions: it was dynamic and changed over time. Reservation and scepticism against the transition team in the beginning, turned into support in Carnisse, but could have also turned out the other way around. This very much depends on targets and their linkages to current policies, but it is also strongly influenced by the specific local political culture and current local challenges (e.g. shrinking budgets).

Additionally, in Carnisse the dynamics between those actors that aimed to re-open the community centre and the local government or political actors changed drastically when the time came for tangible action and the possibility of funding through subsidies or other mechanisms. Participants involved in the reopening of the community centre were looking to these actors for financial support, but instead they were kept at a distance and both policy and political actors were sending contradictory responses. This led to an increased indecisiveness on the part of all involved. The lack of transparency and the lack of trust mentioned earlier resulted in a lengthy implementation process with mutual conflict and frustrations, in spite of the best intentions of all actors involved.

For discussing the relation of the group with the wider context, we turn to the relation of those in the community arena group, i.e. the frontrunners, and those who were not invited. Frontrunners were identified as those individuals who were passionate about the neighbourhood and were active in it (rather than using the criterion of simply living in the neighbourhood), with new ideas and creative actions. Next to demographic criteria, it was important that the group should be diverse in terms of background (inhabitants, artists, local entrepreneurs, public officials, etc.). It was possible to get people involved with less formal education and/or low incomes, but it proved to be challenging to include people from a variety of ethnic groups. The arena group, consisting predominantly of so-called 'white Dutch natives', had indicated throughout the process that they miss diversity and

the perspectives of others that also live in the neighbourhood, e.g. people with Turkish, Antillean or Moroccan roots (almost 60% of the inhabitants of Carnisse are of 'non-Dutch descent'). Their voice was partly brought in through the initial interview round, but none wanted to take part in the arena group itself (although some joined an incidental session). The integration of participants younger than 25-30 years was also challenging. Nevertheless, the transition intervention was successful overall in creating a new communicative space and in diffusing and translating paths for ideas.

Empowerment and social learning, both explicit aims of transition management approaches (Avelino 2011, Loorbach 2007), can also be taken to be outcomes of the arena process in Carnisse. Especially the open-ended agenda of the process gave people the feeling of being able to choose what to put on the agenda and that no certain policy agenda was "imposed" on them (which they feel is often the case). This gave them a sense of choice and, because they could put forth topics important to them, a sense of meaningfulness, both aspects of intrinsic motivation (Avelino 2011). For participants in Carnisse, this also positively distinguished this project from other processes carried out in the neighbourhood in recent years. People followed the invitation to join the process so as to gain a better picture of the whole context in which they were living and working or very specifically to keep the community centre open. Engaging in the arena was described by some even as part of their responsibility as a citizen. Exchange and discussions in a diverse group created a fruitful atmosphere for collaboration and learning. The latter was reported by participants in terms of knowledge about the neighbourhood or specific skills (e.g. speaking in front of a larger audience) as well as a change in perspectives.

Case 2: Finkenstein, Austria

Local context

Finkenstein am Faaker See is located in Austria, on the border to Slovenia and Italy. It is one of the largest communities in Carinthia (one of the 9 Austrian Länder) with regard to population and area. About 8,500 people live in Finkenstein - distributed over about 28 villages and settlements and divided into a Slovenian-speaking minority and a German-speaking majority. The main economic sectors are tourism and (small-scale) industry; agriculture also plays a role. The focus of the community arena process was on quality of life. The process was co-financed by the municipality and the vision has been realized through action-oriented projects or deliberative processes in a number of Working Groups, e.g. on economics, sustainability and social issues.

Process

The pre-preparation phase consisted of desk research and around 65 personal and telephone interviews. This provided the basis for the system analysis and the identification of frontrunners. After a press release was published in local newspapers, a kick-off meeting was held in January 2012. High attendance (over 100 participants) demonstrated a keen public interest in the initiative.

The concept of the transition team was filled in differently in Finkenstein. Rather than driving the process, which was done by the researchers, the transition team was made up by stakeholders representing the community from a variety of dominant institutions and political parties. They first met in March 2012 to clarify members' expectations and discuss the project process. Shortly thereafter, during their second meeting, the team

decided to set up two working groups with broader community participation to follow up on two of the main themes (e.g. economy) arising from the scoping and visioning phase.

The community arena – fifteen community members from diverse backgrounds in terms of place of residence, age, gender and professional or educational background – was convened between March and June 2012. Using the dynamic facilitation method, the main topics of interest were identified: environment, energy, mobility/tourism, economy, agriculture, local supply, social topics and population. The arena's second meeting focused on vision building. It resulted in a collage of pictures representing Finkenstein 2030, as desired by the participants, a theatre play, a fictional interview with a local newspaper and the definition of a set of core statements for the vision. The third meeting started with a discussion between arena participants and transition team representatives over possibilities for citizens' involvement in political processes. In response, more space was given to the envisioning process, during which abstract long-term visions are separated from short-term wishes and demands. By the end of the meeting, visions for Finkenstein's sustainable and liveable future were drafted. These were then combined into a shared vision at the beginning of the fourth community arena meeting which also served to determine what measures were to be taken in order to achieve the joint vision using the backcasting methodology. In addition to the guidelines for the vision, a logo was created representing the joint vision. The words used to formulate the vision were chosen to represent some of the values central to the community arena members – translated from German it says: "We shape Finkenstein for the benefit of citizens and nature in freedom, with joy and love of life."

Eight thematic working groups were then formed to develop measures fitting the vision and one to two participants were recruited to coordinate them: "Sustainable Economy" (with three subgroups covering tourism, local businesses and local retailers); "Environment and Sustainability"; "LifeEnergy" / "Lebensenergie" (systemic perspective); "Social Affairs"; "Participation"; "Energy supply" (later merged with the WG on 'Environment & Sustainability'); "Culture"; "Kanzianiberg" (integration and traditions); and "Mobility" (later merged with the WG on 'Environment & Sustainability').

A public event in early August was used to disseminate the common vision, pathways and agenda. Expanding the transition network was the other key purpose of the meeting and a world café (each table hosted one working group) was held for community members to join the working groups and provide feedback on the work done so far. To further extend public involvement in and knowledge of the project, a short report and a call for participation were published in the community newspaper. During the summer, the working groups were busy organizing themselves and discussing which topics they should focus on. Finding a suitable way to work together (How many meetings? Who will lead them? How to take decisions in the working group? etc.) took quite a lot of time and energy for some of the groups. In September, the researchers organized a meeting for all people involved in the project. The aims were as follows: connecting the activities carried out by the different working groups, stimulating communication between them, identifying where support was needed and raising motivation. After an extended round of updates from all working groups, the remaining time was used to discuss and agree on how to work together and how to organize communication within as well as between the groups. The need for more trust and thoughtfulness was often expressed, especially concerning concrete actions and measures.

After this meeting, an intense working phase began, characterized by several meetings within the working groups, as well as the development of measures and efforts to integrate more community members. A password-protected space was created on the project website, making available all working group minutes and documents, and a

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newsletter was sent out in October, which reported on the past and upcoming activities of the working groups. In November, the researchers organised and facilitated the next project meeting that started off with an exchange of information on the proceedings of the working groups; discussions and project ideas were shared among participants. The focus was on making decisions about possible measures, which were presented and checked for consistency with the common vision. Measures considered to be incomplete were returned to the appropriate working group for revisions. Table 2 presents a selection of approved measures. Most of them have been implemented; some are still in progress.

Table 2: Selected measures in Finkenstein (as of June 2013, Wittmayer et al. 2013b)

Title	Working group	Description	Status
« Town reporter » / « Dorfjournalist »	Participation	The participants of these workshops should acquire basic knowledge about writing articles for the community newspaper. The aim was to write the community newspaper in a more participatory way with contributions of a higher quality.	Completed: workshops held on 18 January 2013 and 1 March 2013
« Hello Neighbour » / « Hallo Nachbar »	Social Affairs	This meeting takes place once a month and aims at closing the gap between people who grew up in Finkenstein and those who moved in later. For this reason, people from the working group « Social Affairs » invite some neighbours to an informal meeting in an inn or restaurant and encourage them to invite other people along as well (snowball effect).	Ongoing: monthly meetings
“Terra amicitiae – application for a climate and energy model region “ / “Terra amicitiae – Bewerbung zur Klima- und Energie-Modellregion”	Sustainable Economy (Energy)	In collaboration with the neighbouring communities Arnoldstein and St. Jakob im Rosental, Finkenstein forms a region that aims for energy independency and for improving sustainable transport.	Completed: application was accepted, measures in progress
« Event Series Sustainability » / « Veranstaltungsreihe Nachhaltigkeit »	Environment and Sustainability	Six public talks from experts on main topics in the area of sustainability (nutrition, mobility, housing, etc.) should be organized. Through this measure awareness of topics concerning sustainability should be increased and best practices should be publicized throughout the community.	In Progress: First talk planned for mid-2013

Outcome

In the following we look into the dynamics within the groups that were formed through the process, as well as their relation to the political and wider societal context, before considering empowerment and learning as aspects of such processes.

After the end of the facilitated group meetings, participants articulated their need for someone to take over a portion of the research team’s tasks (e.g. internal and external communication, organisation of meetings, etc.). Those actively involved in the project

elected eight representatives to comprise the 'coordination team' in a 'sociocratic election'. It is noteworthy that the election process was organised and facilitated by participants of the community arena themselves (which in itself is connected to group empowerment). The research team was only consulted on minor issues. At present, this elected coordination team leads the process of realising the vision for Finkenstein 2030 and organizes primarily the interplay of the working groups for the coming two years. Again each of these working groups is led by one person on a voluntary basis – the resulting structures show a high degree of organization.

As well as the co-funding by the local government, the direct involvement of local political actors and decision makers in the community arena was different than in Carnisse. Similar to other (particularly rural) areas in Austria, Finkenstein currently hardly knows participatory governance. The curiosity and interest of the community in such a process was immediately clear during the well-attended public launch event, where the research team outlined the process and goal. This meant that the participatory approach was a new experience for the community arena participants. Also, during the process interest by local policymakers and politicians was so high that the methodology was adapted and the transition team received a different function (see above). In this team, they could be given a role in the process. During the arena process, some people from within the municipal government and administration started to act as important contact persons for citizens in Finkenstein. Overall, the relationship between local government actors and the community arena was perceived as a positive one. Government actors were supportive during the implementation phase. However, there was scepticism in the beginning by the conservative and rather right-wing parties (three of them exist in Finkenstein). The co-funding had to be approved by the city council and it did not pass by a particularly large margin (51%). Conservative and right-wing party members remained critical throughout the process, with only one exception.

In relation to the wider societal context, the research team made an effort to identify and select engaged citizens for the Community Arena who reflected the diversity of Finkenstein, while not being representatives of the predominant political or institutional system. Although it was difficult to achieve an ethnically mixed group in Finkenstein, groups were quite diverse in terms of age, gender, professions, etc. The participants appreciated this diversity, as it gave them the possibility to gain new perspectives and unconventional insights, a very important condition for social learning. The implementation of the community arena methodology led to new local networks with unique compositions and was identified as being very important by the participants themselves. A participant described the networks as offering a platform for discussing ideas and worries about the shared living space: "Through the process the group got stronger than the sum of its single members."

In terms of empowerment, community members were generally interested in co-creating their environment in order to increase quality of life – some participants even described this engagement as part of their responsibility as a citizen. Asked during the evaluation phase, participants generally believed that they could have an impact on the local environment, though some were sceptical of such claims mainly due to their high expectations about the process that involved large segments of the public and lead to too many measurable outcomes. These concerns were addressed through the learning process, which emphasized that transitions occur in small steps and need time. The wish to have an impact on the community also led to an increased interest in local politics – some of the arena members organised themselves as a group to participate at a local council meeting ("we want to know how this works"). Additionally, two participants decided to stand as candidates for the local council.

Participants reported that they learned about their possible impact, their roles and the roles of others in the project. This increased awareness led many participants of the community arena to change their attitude towards the future. They stated that they could encounter future developments in a more relaxed way and put a greater focus on the present after experiencing that can actively influence developments. Participants also reported an increased self-reflexivity and attention through contact with other, formerly unknown people. Some participants described themselves as being more open and having fewer prejudices in interactions with others. These second order learning processes are complemented by more first order learning processes, which centre on concrete skills, e.g. facilitating meetings and working respectfully together in diverse groups. Trust-building processes were successful and guaranteed a safe space for fostering second order learning. Participants explicitly reported some surprises ('eureka moments') they came across during the project, e.g., the insight that some apparently individual worries (but also ideas) are shared by others or that social cohesion is not very strong among the long-established population in Finkenstein.

Discussion

In this section we explore an emerging understanding of what a transformative potential of communities stands for and to what extent and how it can be enhanced. We do so by referring back to the analytical frame drawn up in the beginning and by comparing the two cases. The analytical frame contained nine elements which taken together describe characteristics of communities with transformative potential the potential of communities to transform themselves and their surroundings. These characteristics are:

- a shared perspective of the present and the future (i.e. a vision of a sustainable future)
- a diversity of perspectives with regards to pathways
- an attitude connecting short term actions and long term vision
- (inclusive) networks across actor categories, domains and levels
- an environment that is supportive of learning, experimentation and reflexivity
- needs of the community are met now and in the future,
- alterable social relations in an environment of participation and direct action,
- access to resources (e.g. money, time, power, networks, political will),
- an emphasis on empowerment and learning.

In the following we discuss the case studies along these nine characteristics so as deepen our understanding of the transformative capacity of communities in the context of sustainability transitions.

We propose to cluster the first three elements for this discussion: they relate to the shared and acted-upon perspective on the present and a desired future which integrates diversity. In discussing these elements a number of questions arise, most prominently is the question with regard to who are the ones to share a perspective on the present and the future. In the case of Carnisse there had been a vision drawn up in 2009 under the guidance of the municipality, district municipality and housing co-operations. But only a minority of interviewees were pointing to this vision in the very beginning of the involvement of the InContext researchers in Carnisse. In Finkenstein there was no vision for the community drawn up to date that involved inhabitants.

The community arena process resulted in a shared problem perception and vision, including a number of pathways for both communities. Shared by whom is also the question here: In Carnisse it was a group of about 15 people drawing it up. A much smaller group out of these 15 felt ownership for presenting and disseminating it further in the neighbourhood and to actually acting upon it. The action in turn, amongst others the re-opening of a community centre has an influence on the whole neighbourhood. In Finkenstein, the ownership was felt much broader, including political actors in the transition team – which opens the opportunity of the vision, or its underlying principles dripping into and influencing local policy making.

Having a shared understanding of the present and the future results into a group of like-minded people who have aligned their thinking and reasoning about the life of the community and build a new network. This brings us to the next element, inclusive networks across actors, domains and levels. Such a network has not been deliberately build earlier in the two cases. The networks that existed included people who knew each other, amongst others through sharing personal or professional interests, or from living close to each other. These networks could be politicised in terms of party political affiliations in Finkenstein, but not in terms of sharing a well-founded deliberately reached perspective on the present and a vision for the future.

The latter is an outcomes of the community arena process, namely the creation of new action-oriented networks sharing a perspective on the present and the future. Especially in Finkenstein the network shows a promising potential for broader networking activities and an intensified exchange of ideas towards sustainable developments, i.e. the realization of the visions that the communities drew up (more on this below under social relations). These networks comprise people from a variety of perspectives and backgrounds that have not interacted previously and now meet in an open and trustful atmosphere. This leads to an enhancement of the social capital of the community (in terms of establishing new relations within and between groups).

The following element, an environment that is supportive of learning, experimentation and reflexivity, can be discussed together with the emphasis on empowerment and learning. Both touch upon the importance of learning in general, based upon experimentation and/or reflexivity and accompanied by empowerment.

Based on evaluation and monitoring interviews (to enhance reflexivity of the process) that have been held at the end of the community arena process, the participants self-reported that the process contributed to an on-going learning and empowerment process in their communities. Through the processes, the participants' belief that they are able to direct their actions to desired ends could be strengthened. Participants of all pilot projects reported several learning experiences, including first as well as second order learning (Argyris & Schön 1978). In Carnisse as well as in Finkenstein, people reported that they learned about their possible impact (see below) and their own and others' roles in the project. A very important learning experience shared by all pilot project participants was the experience of working together in a respectful and constructive way even with previously unknown people and in a very diverse group. All learning experiences mentioned so far can be defined as second order learning processes. They all touch upon underlying values and assumptions – about the roles of different actors in shaping the local environment, ways of collaborating with different people and, subsequently, attitudes towards the future. Second order learning processes of this kind are crucial for transition processes as they open windows for behavioural changes and help deal with increasing uncertainty and complexity. These second order learning processes are complemented by more first order learning processes, which centre on concrete skills. Examples for these are: speaking one's mind in public and in front of a large group of

people (e.g., 100 people); facilitating meetings; working respectfully together in diverse (e.g., intergenerational) groups.

Defining empowerment as increased intrinsic motivation, the community arena process had positive effects on all four intrinsic task assessments outlined by Avelino (2011): choice, impact, meaningfulness, and competence. The fact that the process had an open agenda contributed greatly to the participants' feeling of self-determination: they could choose what to put on the agenda and no specific policy agenda was 'imposed' on them. In both Carnisse and Finkenstein, most of the participants stated that they can have an impact on the local environment. Others were more sceptical, an attitude mainly resulting from the high expectations of participants in terms of the process (e.g. it should involve a large part of the public and lead to many measurable rather large-scale outcomes). These expectations were addressed through the learning process, emphasising that transitions occur in small steps and need time. Participating in the process also led to a heightened interest in local politics and in becoming a candidate in the local council elections in Finkenstein. The link between a project's goal and the ideals of individual participants is assumed to have an empowering effect. In both cases, participants stated that topics important to them have been tackled throughout the process. The last task that was assessed was the gaining of competences, which is closely related to social learning. Participants gained competence in a number of skills (e.g., speaking in front of many people, working together) and also changed some underlying values and assumptions (i.e., related to people with different backgrounds). All of this strengthens the perceived competence and therefore has an empowering effect. This points to the importance of taking into account different levels where transformative potential can reside and be brought into play: in transforming the individual, in transforming the community and in transforming the wider surroundings.

From learning we turn to the element of the needs of the community which should be met now and in the future. Discussing needs asks for the definition of what is meant with needs. Mouleart et al. (2010) refer to the basic needs of humans. Within the context of InContext, the concept was used in terms of the conceptualisation of Max-Neef (1991), who differentiates between the following ten abstract needs: subsistence, protection, affection, understanding, participation, idleness, creation, identity, freedom, and transcendence (Schäpke and Rauschmayer 2011, Rauschmayer et al 2011).

Meeting the needs of the community as the content dimension can be discussed by first analysing the system analysis of both communities where unmet needs are part of the puzzle. Further we can look at the different measures that have been implemented in both communities, as well as at the visions drawn up by both communities. These reveal needs and associated values such as belonging, economic security, entrepreneurship, or environmental values, all underlying the transformative potential of the communities.

The following element to consider are alterable social relations in an environment of participation and direct action. Important to scrutinize here is the local contexts and the differences between the cases. In Finkenstein, neither the inhabitants nor policy makers had a lot of experiences with participatory processes, thus no difficult reference experiences existed. In Rotterdam-Carnisse, on the other hand, previous experiences with participatory processes overshadowed the process especially in the beginning, but also had its repercussions during the presentation of the vision to the neighbourhood.

The changes in social relations can be traced in Carnisse and Finkenstein when looking at the relations of the community arena and the political context. Recalling the processes outlined earlier, we can distinguish between different development trajectories of such a community arena group:

- The community arena group selects a ‘coordinating team’ from its participants, which organizes the different working groups that have been created to realize the group’s vision, i.e. Finkenstein;
- The community arena group ceases to exist formally after the facilitated meetings, while the working group on a specific experiment evolves into a formalized structure, i.e. a foundation as in Carnisse.

These trajectories each show a different degree of formalization of leadership (or social relations). What distinguishes the foundation from the sociocratically elected coordinating team are the legal and financial implications of the former. Alternative practices and structures are part and parcel of a sustainability transition. In this respect, the Finkenstein trajectory is interesting: Holding a sociocratic election can be seen as experimenting with a new way of decision-making that does not fit the current majority vote system. Through this election, Finkenstein is also pioneering new practices and roles with regard to decision-making and participation, as well as emphasising different underlying values. Taking the context into account, establishing an inhabitant-led foundation can clearly be seen as a social innovation in Carnisse, re-ordering the relations between ‘inhabitants’, politicians and policy officers – a long and intense process where all actors struggle with filling their new roles.

Overall, Finkenstein had a more intense process resulting in a number of working groups and including network meetings. The latter aimed at bringing together the transition team and the community arena. While in Carnisse, the transition team was much more operational, in Finkenstein it involved stakeholders representing the community from a variety of dominant institutions and different political parties. Both cases are part of a vivid discussion about whether these kinds of interventions should be of a temporary nature (disperse and spread the vision narrative into individual networks) or formalised and integrated into pre-existing legal structures. Based on the findings, the less local governments or political actors are involved, the more independently the community arena can operate. This means that the outcomes of the arena (e.g. the vision, the local agenda or the experiments) are less influenced by policy agendas. This, however, can be perceived as both positive and negative. Less policy or political interference also implies more pressure on local communities to deliver results or undertake actions themselves. On the other hand, it also contributes to a stronger feeling of ownership and empowerment. But what are the consequences of a more intense and positive relationship with policy or political actors? The case of Finkenstein shows that this can lead to more support and decisiveness in the implementation phase, which relieves the community arena participants of their (time and/or financial) investments and responsibilities. All in all, the involvement of policy and political influence in a community process is a balancing act for both the local government and arena participants. The choice to go for more or less involvement depends strongly on the described context and historical relationships and projects, as well as on the motivations and aims of the participating frontrunners and community actors. In the cases at hand, the co-financing through the local government also played a role. In Finkenstein some political parties were very critical and considered it a waste of money, while others were very positive.

The latter point also needs to be taken into account when thinking about the access to resources, in terms of access to power networks. In terms of financial resources, the aspect of co-funding is interesting in both pilots. Co-funding creates opportunities for a more intense process (both in terms of commitment and interest of actors, e.g. political actors as well as of number of meetings) and for increased exposure. Through the co-funding and governance context, political actors in Finkenstein showed a high level of interest and commitment. Co-funding might increase the relevance of the process and its

outcomes, as well as its embedding in on-going processes and institutions. It can also lead others to join into the process of change and adopt (part of) the systemic perspective that the group worked on or it can provide the organising team with additional resources in organising the process. At the same time, co-financing might also introduce power imbalances or political tensions, money-oriented interests or dependencies, and influence the way others perceive the research team. It increases the need for accountability (not only to the additional funders but also to other stakeholders) and the possibility of critique as the process might be seen as the playing field of different interests.

Synthesis: Individual, community and system transformation

In this paper our aim was to explore an understanding of the transformative potential of communities and whether and to what extent it can be enhanced. In this section we synthesise the discussion and put forth some elements of the community arena process that more generically can be seen to enhance transformative potential of communities.

From applying the analytical framework to two cases, we can adapt the understanding of transformative potential of communities that we brought forth in the beginning and which was based on insights from the literature on sustainability transitions (management) and social innovation. This adaptation concerns two aspects.

1. When referring to the transformative potential of communities, we focus on the potential of communities to transform themselves and their surroundings so as to address persistent problems (i.e. societal challenges) and to contribute to a sustainability transition. From the discussion above, we are inclined to add another dimension, namely the potential of communities to create space for the transformation of its individuals, next to their potential to transform themselves and their surroundings.
2. The nine elements brought forth in the beginning for constituting transformative potential of communities from a sustainability transitions and social innovation perspective, can be merged to result into the following six elements:
 - 1) a shared and acted-upon perspective on the present and a desired future which integrates diversity
 - 2) (inclusive) networks across actor categories, domains and levels
 - 3) a learning environment, based upon experimentation and/or reflexivity and accompanied by empowerment
 - 4) needs of the community are met now and in the future,
 - 5) alterable social relations in an environment of participation and direct action,
 - 6) access to resources (e.g. money, time, power, networks, political will),

The case studies and the interventions (in form of the community arena) discussed, where based on the same sustainability transitions perspective as is the explorative understanding of transformative potential. This brings with it that the elements of transformative potential as put forth by the sustainability transitions perspective are also elements and goals of the community arena process – which asks for some more critical reflection. Using insights from social innovation literature, which has to date not been connected to sustainability transitions, shows overlap in terms of empowerment and learning but also valuable additions, such as the view on social relations and access to resources. These latter two are helpful in gaining more insights into how communities can use their potential to transform themselves and their surroundings.

This transformative potential can be enhanced through outside interventions that create an open, diverse and emancipatory space for societal learning. This space can enhance the transformative potential of communities in a number of ways:

- 1) provide direction (i.e. sustainability)
- 2) support the creation of networks for people who feel the need for change
- 3) emphasize learning and reflexivity (including reflections on values, beliefs and assumptions)
- 4) increase a feeling of impact, choice, meaningfulness and competence of individuals and groups (i.e. empowerment) in addressing local needs
- 5) support changes in social relations of individuals, organizations and institutions (i.e. create networks, change role activities)
- 6) offer access to resources through e.g. third-party funding, establishing new networks.

Overall, the transformative potential of communities in the light of societal challenges can be enhanced through empowering processes such as the community arena methodology. Change-minded people are coming together in an open and diverse setting and, by thinking about the future, they not only reflect on their own perspectives and values, but are also confronted with those of others. The process aligns perspectives, while nourishing diversity. Envisioning the future in images, texts and emotions supports this individual and group reflection and opens heads, hands and hearts. Linking this vision to the tangible present provides a space for the inner and outer contexts to interact: the process provides levers to participants for enhancing their transformative potential as a community. The extent to which such a space can be created very much depends on the local context (e.g. history with participatory processes) and the skills of the researcher and/or facilitator.

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Discussion Report

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Moderator: Katharina Umpfenbach, Ecologic

The discussion, moderated by Katharina Umpfenbach, started around the 'group think' phenomena, with participants raising the issue of how people interact with each other in groups in either scenario building or visioning exercises, the main themes of this working session. 'Group think' tends to have a negative connotation, but perhaps there's a more positive side to the coin? The main thrust of the Pesch paper is that people like to reach consensus in a group, but in some cases the goal may not be to reach consensus but rather to show that different scenarios are possible, and that there are diverging scenarios. Methods used will depend on what goal we wish to achieve, a point that we returned to later in the discussion.

The question of culture and personalities came up, or how people from different countries and contexts, and with different personalities can come together in a workshop. Culture is also significant when determining how to design a workshop, for example when working with a community that is known for being 'at risk', it would be important to not play up that factor in a future scenario – to avoid people feeling defensive or boxed into a stereotype. This should not be the starting point. But at the same time you must also take into account history, getting people to understand how they got to the present, before thinking about the future.

In visioning, different creative methods can be used, such as interviewing someone from the future, or creating a theatre play or collage. A discussion ensued over the fine line between letting people project different imagined futures, being realistic about what is possible, and limiting the ideas to those that are 'sustainable'. This leads to the question, who decides what is 'sustainable' and for whom? One way of dealing with this is to pose questions, to impart systems thinking, to raise the ecological consequences of certain decisions, asking what is the consequence of your decision? Why do you think it is important? In some cases, it's good to let things go, while in others you want people to be aware of the different connections. Again what is important is the goal you are trying to achieve. This could be a distinction between visions and scenarios: scenarios are more practical, while visions may be valuable in bringing people together from different domains. Scenarios may be for groups who have a shared function and purposes, which are more homogenous.

The Wittmayer et al. paper was about understanding what is meant by the 'transformative potential' of local communities. When asked about the question of scale, the main author responded that there could be three layers: the individual ability to change, the community itself changing, and the community coming together towards change on a wider scale. One issue that was raised with this form of 'action research' is that we actually can make a difference as researchers, and what does this mean in the long-term? The consequences can be negative or positive, and in a sense we may be responsible for a 'Frankenstein' effect. Certain projects may be creating new elites for example, that are supposed to steer communities but that can also exert power over them in their own personal interest. There can be an accelerator effect, but projects can also backfire. One solution is to be explicit about roles among members of the community. When discussing process design, there are many questions from 'participants' regarding the role of researchers, i.e., 'who are you, what is it that you do'. In one situation, the community members came up with their own definition for the researchers, calling them 'activated researchers' playing on the term 'activist', which made sense to them. In an ideal situation, you would want to give the community the tools in order to conduct their own visioning or scenario building, but the learning curve can sometimes be quite high. Communicating between the groups helps towards transparency. On a local level this is relevant, but also on a more urban and national level. The issue is accountability but also follow up. If you take people out of a context to play a different role, what are your ideas for people who go back to that context? Do you expect some change to happen? Where does it lead to in the future?

Selecting participants is central to the methodology. You can do interviews with people prior to the process to have an idea of where the person comes from, his or her role in the community. The issue of transparency is very important, as well as reflexivity. In certain disciplines, such as anthropology, researchers are always reflexive, pondering on their role as researchers and their 'impact' on 'the field'. This relates to the observer effect in physics, whereby the mere act of observing entails modifying what you are observing. Another proposition was that an ethics committee could be established (perhaps at the level of the funding agency?) to address issues related with 'action research' or the potential of transforming communities.

One of the successes of visioning and scenarios is that ultimately, they are becoming more accepted as a methodology. There is more openness to these approaches, based on work with policy-makers. This is particularly true in relation to societal elements which policy-makers find difficult to apprehend. These tools can help explain the heterogeneity of social life and divergences in society, in a policy context that tends to bring together people with similar backgrounds towards 'consensus' and 'status quo'.

3b

**Backcasting,
scenario analysis
and pathway
development**

Pathways to sustainable change in organizations

The role of participatory back-casting in ensuring workers' autonomy and control as well as transference of practices between life domains

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Abstract

As a key practice of everyday life, work is a place and space where the sometimes contradictory demands of economic profit and environmental sustainability meet and are negotiated, with the resulting effects on work practices, energy consumption and greenhouse gas emissions. As people spend an important part of their lives at work, within a community of values, norms and everyday practices, it is also the place where identities are negotiated, where individual values are transformed and where sustainability-related behavior is either promoted and rewarded or hindered and discouraged (Brown, Kirpal & Rauner, 2007).

Furthermore, large-scale organizations are responsible for a high amount of greenhouse gas emissions and at the same time are contexts where interventions for change can be implemented successfully and potentially translated to other domains of life. The LOCAW project has set out to research the barriers and drivers to sustainable practices in organizations and the conditions and pathways for transitions to sustainable lifestyles both at work and beyond. To reach this objective, it has studied six large-scale European organizations, both private and public, in six different countries and has used a mix of empirical research and simulation approaches to create a comprehensive account of the determinants and pathways for transitions to more sustainable organizations in Europe.

The present paper presents the backcasting methodology used within two of the studied organizations in the LOCAW project, in order to design sustainable scenarios for the future and define the pathways to reach them. We present in detail the role of the back-casting methodology within the project, the approaches used and the results obtained, as well as comment on the implications they have for policy.

Keywords: sustainable practices, large-scale organizations, back-casting, future scenarios.

Introduction

Large organizations in Europe are responsible for a high amount of greenhouse gas emissions. Estimations have shown that the potential contribution of large organizations to global warming over the next 100 years will be highly significant: 72 % CO₂, 18 % Methane, 9 % Nitrous Oxide (Emission Database for Global Atmospheric Research, 2000). While there have been achievements in the cleaning of production processes, the reductions derived from changing practices and behaviors in the workplace have not been sufficiently targeted.

As a key practice of everyday life, work is a place and space where the sometimes contradictory demands of economic profit and environmental sustainability meet and are negotiated, with the resulting effects on work practices, energy consumption and greenhouse gas emissions. As people spend an important part of their lives at work, within a community of values, norms and everyday practices, it is also the place where identities are negotiated, where individual values are transformed and where sustainability-related behavior is either promoted and rewarded or hindered and discouraged (Brown, Kirpal & Rauner, 2007).

In their everyday life, people move constantly across areas of life in which they occupy different positions, inhabit different environments and activate different parts of their identities as they take on different roles. LOCAW has aimed to study the barriers and drivers of sustainable practices in organizations, but also those affecting the transference of practices from one life domain to another, especially home and work. Our results show that the configuration of levels of worker control and autonomy over areas of practices are of particular importance in determining practices as well as in allowing or not for transference of practices among life domains. The level of control over one's own behavior and over the work environment, and the level of autonomy of action within the organization are key variables in going towards sustainable change in organizations. The structuring of participation and communication processes is one of the factors influencing control and autonomy.

LOCAW has used participatory back-casting in four case-study organizations (University of A Coruña, Spain; Aquatim, Romania; Enel Green Power, Italy; Municipality of Groningen, The Netherlands) with a two-fold purpose: to create scenarios for the future with the input of workers at different levels of the organization and to design reasonable pathways for sustainable change that could then be tested in a simulated environment. Due to space limitations, only two of the cases will be reported here.

Theoretical bases of back-casting

Back-casting scenarios constitute a relatively new methodology in the field of sustainability and climate change. Despite its appearance and theorization in the decade of the '70s, it is only recently that it has become widely used as an instrument in helping decision-making processes in policy-making. The back-casting scenarios methodology

appeared in response to the discontent with the traditional methods of trend extrapolation in energy forecasting, where it was assumed that energy demand would increase gradually and renewable energy technologies and energy conservation efforts were ignored (Vergragt & Quist, 2011).

In future and sustainability studies, back-casting scenarios are defined as a methodology that allows us to envision and analyze different types of sustainable futures and develop agendas, strategies and pathways to reach them (Vergragt & Quist, 2011). It has a strong normative component, as it starts from desirable future states or set of objectives and then analyzes the steps and policies that are needed to get there, in order to be able to design agendas that can be implemented and that normally require cooperation and communication among different types of actors in complex socio-economic and political environments. It is considered a useful tool in going toward alternative futures in issues of climate change (Giddens, 2009).

A literature review on back-casting scenarios shows a few important on-going debates on the methodology, which have informed our decisions in LOCAW on how to structure the back-casting scenarios development workshops. The first important debate refers to what should be given more attention in scenario development. Target-oriented scenarios (Höjer et al., 2011) centre more on the development of several endpoints or images of the future states, and more space and time is allocated to this than to the actual definition of measures and strategic pathways to get there. Process-oriented scenarios (Robinson, 1990) are more centred on the ways to structure the process of the creation of scenarios, in order to ensure effective participation of stakeholders and to produce, besides images of desired end-states, possible pathways to reach them and specific agendas for their implementation. One study investigating whether solutions and policy measures proposed in the back-casting scenarios have any impact 5 and 10 years after their proposal showed that the area of implementation is not well covered and that more research is needed in order to ensure that measures are put into practice and that adequate monitoring strategies are also developed (Quist, 2007). LOCAW has taken into account that the process needs to be participatory, qualitative and inclusive and worked on framing it in this direction.

Organizations have an important role in making the necessary changes and in implementing the measures needed to achieve a reduction of GHG emissions. Structuring a good process is likely to ensure higher-order learning (Quist et al., 2011; Brown & Vergragt, 2008) for both the researchers and members of the organization and will also provide the conditions for more involvement with low-carbon objectives, thus contributing to the incentives for promoting measures or performing the systemic changes necessary in the transition to more sustainable organizations.

Another important debate in the domain of back-casting for sustainability centres on the question of who should develop the future vision. Some argue that future visions should be created by experts, while others are strong supporters of involving stakeholders in defining both the future visions and the strategic measures needed to get there (Robinson, 1990; Robinson et al., 2011), as it creates learning, a stronger attachment to the goals, and a stronger feeling of empowerment. In the case of LOCAW, it seems rather obvious that it is necessary to involve stakeholders in the creation of the vision, as well as in the definition of the complex pathways to make it possible, as participation in the establishment of goals is fundamental in personal identification with those goals and thus an important determinant of the willingness to put it into practice. Also organizational stakeholders hold relevant knowledge on the constraints their organization will face in the future and the conditions under which it is likely to have to operate. LOCAW has used a combination of stakeholder and researcher input to generate the images of the future or

desired end-states. Recently, Robinson et al. (2011) has used back-casting scenarios in which intense stakeholder participation was combined with sophisticated tool development providing instant feedback on the effect of the proposed policies on the desired objectives, yielding interesting and useful results as a tool of democratic policy development. In LOCAW, instant feedback is not possible, as constructing the agent-based models will require time and data from other sources within the Project, but feedback is provided in a second stage, in which stakeholders can see how their proposals work in a simulated environment and formulate suggestions for correcting policies in an iterative process.

Methodology

Phases of the back-casting process

In the back-casting scenarios of LOCAW we used a combined approach, using a methodology of focus groups to develop the scenarios, inspired in part by the one used by Svenfelt et al. (2011) in their study on decreasing energy use in buildings but significantly adapted to fit the objectives of LOCAW; and the stepwise approach of Kasper Kok et al. (2011), to orient the process and help stakeholders in getting disengaged with the present, and being able to create truly innovative visions of the future, one of the hardest aspects of back-casting scenarios both with stakeholders and experts (Svenfelt et al., 2011).

The two back-casting exercises followed a different structure, as their objective is different. The first part deals with scenario development and this has been achieved in two workshops. The first one had the objective creating visions of the future for the organization, and the second one dealt with defining the strategic pathways to reach them and the social actors that should be involved. The second part is focused on providing feedback to participants on how policy measures function in a simulated environment and having the participants propose corrections to their initial proposals and to the model design.

Developing visions of the future

Stakeholder analysis

In order to ensure a good process, the number of participants in the first scenario development workshop was maintained between 8 and 12 members of the organization. For the scenarios to be useful and to have the potential of being translated into effective measures within the organization, the project partners undertook a careful stakeholder analysis. The aims were to ensure the presence of members of the organization who have detailed knowledge of the organization, its present policy trends, and of the forecasts on relevant expected or possible changes in the wider policy and market environments; and also to have people in management positions involved, as they have the highest potential to make change happen. Also, based on information from previous stages of the research, care was put into ensuring that the participants did not have significant conflicts among themselves that would have potentially undermined the participatory dynamic intended.

Facilitation

Careful attention was also given to the facilitators' role and training. A training workshop was undertaken at the University of Corunna, in order to ensure that facilitators became familiar with the back-casting methodology and prepared for the challenges that might arise in the process. Facilitators kept participants on track and contributed to maintaining

a future focus in the workshops, as it was observed that participants tended to sometimes be caught in the extrapolation of present conditions to the future. Facilitators also contributed to moving the process along when it became stuck, by highlighting the common ideas and attracting attention to the less-covered areas.

Preparation of the visioning workshops

In order to prepare for the first workshop, the research teams summarized each organization's specific limitations and decided on how many groups should be involved in the workshop, as it is very important not to invite in the same group people with large status differences in the organization, as this might limit the participation and lead to a one-sided vision, defined by just a few of the participants.

It was decided that participants should receive brief information on the method and what was expected from them, in order to diminish the potential anxiety that might arise. Also, they were announced in advance that this is a participatory methodology and that we are interested in their opinions and imaginative ideas, and not so much on their exact knowledge about future trends.

Finally, the teams took care that the environment in which the workshops were undertaken was appropriate. Where possible, the participants were invited in an informal environment away from the organization, in order to facilitate perspective-taking and diminish constraints on the free expression of ideas. A recent study has shown that different social settings have a different impact on scenario development, with "warm settings" yielding better results (Robinson, 2011).

Results

University of A Coruña, Spain

Visioning workshops

The University of Corunna produced three different scenarios for 2050, each becoming more ambitious in the targets they set and the change they suppose. The scenarios are described as narrative accounts of the University in 2050.

A conservative scenario for the University in 2050

The University of Corunna stays in the same place (several campuses) and uses the same infrastructure, although improved and optimized. This vision assumes the necessity of both technological and human changes that would lead to emissions reductions.

The University will have more flexible infrastructures, organized functionally. The buildings have better insulation systems and exterior spaces are adequately maintained. Each building is self-sufficient in terms of energy, having own energy generation system based on renewable sources. In each building, measures for energy efficiency have been implemented, such as interconnected temperature detection sensors based on number of people and movement across spaces. The schedules of university staff have changed and have adapted to the seasons and the corresponding exterior temperature.

The University is self-sufficient and consumes own products. The food consumed in cafeterias on campus is ecologically produced, and respond also to educational objectives (as they are practical activities for different degrees. The menus in cafeterias respect health and educational criteria, are vegetarian, are based on local consumption (when the

university's production is not sufficient, cafeterias buy from local producers who are certified as ecological across their production chain). Prices are just, including the environmental cost of products. The University has fewer cafeterias and promotes return recycling. Furthermore, each building has its own recycling center and reaches an objective of 0 waste, by generating subproducts. Green contracting is implemented at all university levels and the cost of products is generally calculated by including ecological parameters.

Paper does not exist in the University anymore. Water provision is self-sufficient.

The majority of both staff and students use public transportation and bicycles to reach the university. As most students live in student residences they can walk to and from the university. Car use is only common for a minority and is not well seen at the University.

A de-growth and de-localized model of the University

The University has been moved to the city and the different communities around it with small and multi-functional rooms in each neighborhood, as support for virtual teaching. This vision assumes a mixed model of education which involves some important technological changes.

The University is represented by these rooms which have state of the art technology for online teaching, as well as individual and group study rooms. The buildings in which these rooms are hosted are completely adapted to their environment (through passive architecture) and their level of emissions is almost 0. These rooms can be used 24/7 hours a week, and possess efficient energy systems which are adapted so as to ensure the minimum consumption possible. All the rooms possess systems of energy self-generation, sensors to detect temperature and adapt it to the numbers of users at any moment.

As in the previous scenario, each room has its own recycling center, and transforms waste into subproducts. Return recycling is also promoted and dangerous materials are adequately processed. Green contracting is implemented at all university levels and the cost of products is generally calculated by including ecological parameters. Each room has its own small cafeteria, which serves vegetarian menus, with local products and at just prices.

Paper does not exist in the University anymore. Water provision is self-sufficient.

The majority of both staff and students use public transportation and bicycles to reach the university. Many walk to and from the university. Car use is only common for a minority and is not well seen at the University.

A virtual and centralized University model

The University as an autonomous institution does not exist anymore. All teaching is done online at different European universities, using advanced technology. This vision assumes important technological and human changes related to this new form of learning and interacting.

It also assumes important political and social changes in a sustainable direction. Universities are few; they teach in one language only and have very good teaching systems, with a competitive international profile.

Each person can learn across the whole life-span and from home. Technology is accessible to everybody and implies access to full interaction from home, through the use of holograms, video and e-conferences. Research is undertaken in European laboratories coordinated through the entire European Union. These new technologies are also allowing

interaction to feel real, as all sensations are reproduced very closely to those experienced in direct contact.

Local policies have contributed to reducing the waste to 0, as recycling centers are easily accessible, subproducts are generated and return recycling is part of the culture of all institutions and services. The number of vegans and vegetarians is bigger, and the prices of any product or service reflect the environmental costs they incur in.

Education-related mobility is reduced to 0. For health promotion, technology for exercising at home is available, such as desks adapted to include running tracks.

Back-casting workshop

First Scenario:

Targets

The first scenario developed for in the visioning workshop was a conservative scenario, in the sense that targets went in the same direction as already existing in the European Union and also in the member countries, including Spain. The first part of the discussion focused around refining the target goals for this scenario, on the basis of the previous workshop and also on estimate emissions reductions calculated by members of the Spanish LOCAW team and presented to participants.

As mobility accounts for approximately 50% of all University emissions, a lot of the discussion focused on establishing targets for work-related mobility. A reduction of car use to 20% of university staff and students was considered worthwhile and feasible for 2050. Within this scenario, 80 % of the university population would use more sustainable means of transportation: 20% would come on foot; 30 % would use bicycles, and another 30 % would use public transportation such as train or bus.

In terms of waste, targets focused mostly on the reduction of paper and water. For paper, a reduction of 80 % of the actual use is intended, while the rest should be recycled paper only. For water, the target is of 0 waste, or complete re-use of all water. "Superfluous" or "choice" plastic such as water bottles would be reduced drastically as well and plastic used in machinery and other necessary devices would be recycled. A target of 30% of meals being vegetarian was established. In terms of energy, a reduction of 30 % was established.

2012-2020

By 2020, public transportation would probably not be drastically improved, due to shortage of public funds and public expenditure, as a result of the economic crisis. Due to this fact, it is likely that mobility emissions would not be reduced drastically, although the plans for a student residence exist and will start building in a few years. Also, the existing plans for bicycle use on campus and increased use of bicycles in Corunna due to a public rental scheme put in place by the local government will likely reduce car use, albeit by a narrow margin. Plans for car sharing will be put in place by then.

Paper will still be used by 2020 at a similar rate to that which is common now, but recycled paper will be supplied as an option and will be purchased by approximately half of the staff on a regular basis. Existing levels of water waste will not be significantly reduced as they depend on investments for changes in existing systems. Options for purchasing glass water bottles and return recycling of glass from machines and cafeterias on campus will be provided and educational and awareness campaigns stimulating the use and return of glass bottles will achieve a 20 % reduction in the use of plastic bottles. This

will also be a consequence of the larger use of water fountains present on campus, as a result of a better signaling and information system which would allow people on campus to know where they are located.

2020-2030

As the economy will start to recover by 2020, and recovery will come from higher investments in research, innovation and technology, it is likely that between these years public transportation will improve. This will be done through a collaboration of local, regional and university planners, which will include a system of on-ground metro or train, which will connect the city with its campuses, as well as with surrounding communities. Coupled with making transportation very cheap and awareness-raising campaigns, around 40 % of present-day users of private cars will start using public transportation. Also the number of online-only scientific events and webinars will increase, contributing to a reduction of 30 % in work-related mobility, including airplane travel, with the consequent reduction in GHG emissions.

By 2030, the university will have a very convenient car-sharing scheme for those still using the car, and the University will have acquired a few electric vehicles, which will be used for car-sharing when going to scientific or academic events for which other form of public transport is not available. The University will have a very easy-to-use online system that would facilitate car sharing and will use incentives such as a system of acquiring points which can then be exchanged for free entrances to cultural events in the city. Also, the university's main campus will reduce the available parking space by half by 2030, by building the campus center (a social networking and studying space previewed in the university plans), and other green areas facilitating social sharing. These measures will make the campus the center of the social life of university staff and students, thus reducing needs for mobility to other places.

Paper consumption will be reduced by 50 % of present use, as higher investments will make possible the changing in formal university procedures to electronic ones (by acquiring the necessary technology). Other efficiency measures will be implemented for energy use, such as presence-detecting lights in all buildings, better insulation where necessary, and possibly infrastructure changes in some of the buildings, including the change in main sources of energy to renewable ones and installing differential control over temperature settings. Feedback systems will be put in place, allowing individual workers, departments and entire buildings to monitor their energy reductions and the significance it has on GHG emissions reduction. Warnings will be sent if a certain level of energy use is passed, thus allowing the person to adjust her use.

Some investments in system changes for the mitigation of water waste will be made. Also, systems for water re-use will be installed in 40 % of the buildings. The use of plastic bottles will further achieve another 30 % reduction, reaching a total of 50 % reduction of the present use. This will be due to awareness-raising, but also to restrictions imposed on providers (as part of green contracting) to campus cafeterias on plastic use.

2030-2050

As public transportation systems are increasingly becoming more efficient, and there is a generational change with today's youth coming into adult age (assuming that their environmental awareness and practice with sustainable practices are higher), acquisitions of private cars will stop being something desirable, and thus a reduction of private car use

to move between home and the university of 80 % of present day users will be achieved. At the same time, besides considerable improvements in public transportation, in terms of frequency, commodity and price, the government, as a result of hybrid and electric vehicles becoming cheaper, starts making some investments in public transportation that is hybrid or electric, thus further reducing GHG emissions related to mobility. Private car users are also increasingly buying “greener” vehicles. Also, due to a re-appreciation of family and community life, measures for working from home are implemented, reaching a reduction of transport needs by a significant amount. Also, as online classes will become more widespread, students will also reduce their need for travelling.

Further acceptance of online-only events will make these more popular among academics, together with the wider investments in technologies that make this possible. Up to 50 % of scientific and academic events will be online-only.

Paper will disappear progressively from use. Only electronic procedures will be used. In terms of energy use, feedback will become more instant with the use of energy-detecting bulbs that turn red when a certain level of energy has been reached. These will be implemented both at the university but also in people’s homes (in the sense of their use becoming more common and desirable), and thus practices of reduced energy consumption will become habitual. The university will be completely self-sufficient in terms of energy by 2050. Progressively, the university will set higher reduction targets for energy among its staff and introduce more efficient technology, and progressive investments in renewable sources of energy.

In terms of water re-use, a target of 100 % re-use will be reached by 2050, with the progressive change in water provision and recycling systems across all university buildings. Plastic bottles use will be reduced to 0, with progressive restrictions on providers, awareness campaigns, and the widespread use of water fountains and glass bottles. Waste recycling will be further improved promoting intense return policies and collaboration schemes among responsible staff. As the vegetarian menus will progressively become more varied and health concerns (especially related to obesity) will become more salient, up to 30 % of the meals of every person will become vegetarian. Compost will be produced from the organic waste of the entire campus

Responsible actors: UDC mainly, but also local and regional government.

Third scenario

The third scenario developed was a more radical one, assuming a model of entirely virtual and more centralized university. Targets for emissions reductions were more radical than in the first scenario. Work-related mobility would be reduced to 0, as the university as a physical institution would not exist anymore. More generally, private car use would be reduced as cities would become more compact and local community life would be enhanced.

In terms of waste generation, discussion in the group did not focus on targets for this, as the idea was to establish reducing targets for the university. As the online university would mostly generate electronic waste, the targets focused around improving recycling of electronics, re-use of materials from computers and other machinery and establishing some wider goals for the reduction of waste at the level of community and personal homes. Same was true for paper, water, energy use and reducing consumption of meat.

This scenario requires a gradual transition to very different forms of interaction, as well as teaching and learning. Participants thought that this transition needs to be done gradually,

through sensitive policies which would ensure acceptability of these new forms of learning and interacting. They also thought that some of the trends present in this scenario are driven by technology and somewhat unavoidable. This implies that the function of policy becomes one of mitigating or correcting for some of the negative effects these trends might provoke, as well as of taking advantage of these trends in order to advance action on objectives such as the mitigation of climate change.

The first part of this gradual transition refers to measures to make technology cheaper and to put in place mechanisms that would provide sufficient funds for the necessary technology. These could include borrowing schemes, possibilities for renting at low prices or a system of donations to lower-income persons. It would also involve that the virtual universities would implement all the necessary technology and train and involve faculty in these new forms of teaching and interacting. Participants considered that their training is key in ensuring adequate coordination among them and with students. The group also raised an important concern which needs to be addressed if this future scenario were to be used as a roadmap, which is the expected loss in direct human contact and the effects that might derive from this, such as increased rates of depression, less quality of training for a profession, or the loss of personal and professional enrichment and development that come through contact. To address this concern, they proposed to create the possibilities of attending classes a-synchronously (through the recording of classes and lectures) without completely eliminating human contact, by using visual materials.

This scenario thus involves several stages of implementing these new technologies and allowing people time to adapt to this new reality, by introducing it progressively. Also, in the initial stages, this scenario involves a lot of training for teaching staff in order to increase technological knowledge. This training should be considered a priority by the governments and direct support for it should be provided. Also, this implies the in-depth understanding of how to motivate people to assume such radical changes. Also, governments should support innovation in technologies that create the sensation of human contact or that promote closer to direct human contact.

Another issue that occupied discussion time had to do with the necessity to create mechanisms through which powerful economic actors with opposing interests could be motivated to assume these changes, by, for example, including environmental costs in prices. Reducing GHG emissions in general would require this change in prices. The University as an institution can become one of the actors generating innovation in environmental policies as well as in efficient technology development and smart buildings.

Finally, participants worried that a full virtualization would not be desirable nor feasible for some disciplines or careers, but argued that these could design flexible plans that would include assisting to some group meetings or laboratories during the year, and mobility could be made as sustainable as possible.

The Municipality of Groningen (The Netherlands)

The back-casting exercise at the Municipality of Groningen was aimed at developing several narrative paths to a desirable future state for the organization, within a sustainable, low carbon Europe.

In February 2011, the Municipality has formulated her ambitions concerning this topic in a so-called "Masterplan". This Masterplan was defined by the council in collaboration with a broad group of key energy experts from the region. They followed a similar method as the back-casting approach used in the other case study areas to create a vision for a sustainable future of the municipality. The pathway and steps described in the Masterplan

all concern structural changes in the organisation. In order to complement the already defined Masterplan of the Municipality and really add value to the LOCAW project and complementing the other case studies, the Dutch team has made attempts to organize a backcasting exercise around the human changes necessary for the organization to become more sustainable. They have encountered resistance on the part of the Municipality, as managers had the idea that theory-driven scenarios for human changes can be implemented and these would be more effective than actually talking to employees about their visions for change. Given the limitations imposed by the organization, theory-driven scenarios were defined based on theories on social and normative influences. These different policy scenarios targeting key factors can and will be tested for effects and plausibility using the simulations from agent-based modelling and if necessary modifications can be implemented based on the results. This will provide valuable insights to the Municipality of Groningen to further promote low carbon emissions at work.

Based on the Masterplan and theory, we created the vision for the Municipality, the pathways to reach that vision and the possible scenarios.

Visioning

The municipality has developed a fundamental vision to become CO2 neutral by 2035 (Master Plan Groningen, 2011).

- Their aim, as specified in the Masterplan, is to fully rely on renewables and sustainable energy sources rather than fossil fuels.
- Still energy related behaviour will be highly important, because energy related behaviour needs to be kept at a minimum to be able to provide the necessary renewable and sustainable energy in an efficient way. Thus a decrease in direct energy use as well as in indirect energy use and CO2 emissions resulting from transport and waste disposal related behaviour are important. Therefore, the second aim is to decrease total energy consumption at the workplace.
- In the context of the Municipality of Groningen, spillover is especially important. In particular the spillover from pro-environmental behaviour in the workplace to pro-environmental behaviour at home is important, because the energy use of employees at home is indirectly also part of the coverage of the Municipality as many employees live in the Municipality in Groningen. Their aim is to create a positive spillover effect of energy saving behaviour from the workplace to home.

Backcasting

Structural changes. To realise the ambition to fully rely on renewables and sustainable energy sources rather than fossil fuels by 2035, the Municipality will develop its own energy company that aims to meet all energy related needs for municipality buildings. The municipality will have solar installations on all suitable buildings and install a heat network to produce the renewable resources required. This means that the environmental impact of energy related behaviour would be strongly reduced. To enhance the efficiency and reduce costs of such a renewable energy system, it is important that overall energy demand within the workplace is significantly reduced as well.

Strengthen biospheric values. Based on theory we argue that the first pathway to decreasing total energy consumption is strengthening biospheric values of employees.

People who are concerned about the environment and endorse values beyond their immediate own interests, that is, biospheric values, are more likely to engage in pro-environmental behaviour (e.g. De Groot & Steg, 2007, 2008; see Steg & De Groot, 2012, for a review). These values are relatively stable over time. Yet, to be influential, these values need to be accessible in specific situations where environmental choices take place. The accessibility of these values varies due to situational cues. For example, situational cues present in the context indicating the importance of certain values, such as principal support for corporate environmental responsibility initiatives, will strengthen these values. Based on the theory we argue that strong biospheric values will lead to more pro-environmental behaviour in different domains: a decrease in direct energy use, a decrease in indirect energy use due to waste disposal and a decrease in indirect energy use with regard to transport related behaviours. Hence, a pathway to less carbon emission at the Municipality of Groningen is to create situational cues where environmental choices take place, indicating the importance of less (direct and indirect) energy use, so that biospheric values become more accessible.

Strengthen environmental self-identity. A second pathway to encourage energy savings at work is strengthening the environmental self-identity of employees. The environmental self-identity reflects the extent to which you see yourself as a type of person who acts pro-environmentally (Van der Werff, Steg, & Keizer, 2013). Based on the theory we expect that a strong environmental self-identity leads to pro-environmental behaviour in general and that a strong environmental self-identity is a requirement for the spillover effect. The environmental self-identity is first of all formed by individuals values. To be more specific, strong biospheric values are associated with a strong environmental self-identity. This means that environmental self-identity is stable to some extent, and therefore potentially a stable predictor of energy-savings, as far as the environmental self-identity is strong. Second, environmental self-identity is formed by previous behaviour, which implies that it can change over time to some extent. Especially when individuals realised that they have engaged in difficult and unique pro-environmental behaviour, or when they have engaged in a wide range of pro-environmental behaviours, their pro-environmental self-identity will be strengthened. This means that reminding people of their previous pro-environmental behaviour or making people aware of their previous pro-environmental behaviour will result in a stronger pro-environmental self-identity. This in its turn will lead to a (further) decrease in energy consumption.

Create autonomy. The third pathway follows from the previous one and involves securing autonomy of choice. As stated above, environmental self-identity is particularly likely to be strengthened when individuals engage in difficult and unique pro-environmental behaviour or by engaging in a wide range of pro-environmental behaviours. Structural changes implemented by the organization or non-autonomous behaviour imposed by the organization is not likely to strengthen environmental self-identity and may even weaken it. Therefore, in order to decrease energy use by employees and increase spillover effects, it is essential that the structural changes facilitate behaviour changes yet secure that people have the perception that their actions are autonomous.

Scenarios

Scenario 1: Structural changes and no impact of behaviour. The Municipality will implement all the interventions indicated in the Masterplan that all reflect structural changes. This means that CO₂ emissions and the impact of energy related behaviour will be strongly reduced. Employees will not change their behaviour to reach for the

envisioned future, the environmental self-identity will not be strengthened and there will be no spillover effect of pro-environmental behaviour from the workplace to home.

Scenario 2: Structural changes and possible impact on behaviour. The Municipality will implement all the interventions indicated in the Masterplan that all reflect structural changes. This will again mean that CO₂ emissions and the impact of energy related behaviour will be strongly reduced. Then, if the Municipality can show that the organization is sincerely concerned about the environment this could be a cue or prime increasing the accessibility of biospheric values, thereby strengthening employees' environmental identity and encouraging energy saving behaviour at work.

Scenario 3: Structural changes and behavioural changes top-down introduced. Besides implementing structural changes, the Municipality will also implement interventions aimed at reducing energy use at work. The different interventions will be introduced by the management of the Municipality, which means a top-down implementation. Top-down decision-making can be a quick and effective way of implementing interventions. Yet, in this way the impact of the behaviour and the behaviour itself will be changed in a non-autonomous way. This implies that the environmental self-identity will not be strengthened and a spillover effect will be unlikely.

In the implementation, we argue that it is essential for higher-ups to support the interventions and confirm themselves to the rules. For example, consider the current policy of the Municipality to discourage car use. This policy states that there are only a few designated parking places, which are solely offered to employees carpooling, and to those driving energy-efficient cars that emit less CO₂. It is important that managers and supervisors do also comply with these rules, because when the organization imposes pro-environmental behavior, managers and supervisors are seen as standing for these policies prescribing pro-environmental behavior in the organization. Deviating from these policies, by this group, is a clear sign that these policies are not important and will weaken the motivation to comply among the other employees. It will result in a particularly strong negative effect on energy savings among the employees.

Scenario 4: Bottom-up behavioural changes introduced. The Municipality will implement structural changes so that only renewables and sustainable energy sources are used instead of fossil fuels, but realises that behaviour changes are needed to increase the efficiency of the system. For example, it will still be important for employees to recycle their waste, and turn of their lights as to being able to provide the necessary renewables and sustainable energy in an efficient way. Then the organization will cooperatively implement interventions aimed at behavioural changes. Employees will be involved in the decision making process and management will support bottom up initiatives. Also, energy saving behaviour is facilitated. Bottom-up decision making will be slower, but it will result in more stable behavioural changes. In this way employees can encourage each other to use less direct and indirect energy and because the behavioural changes are autonomous, employees' environmental self-identity will be strengthened among those who engage in the behaviour. This will ultimately lead to less energy use at work and a spillover effect from the workplace to home.

Conclusions

The LOCAW project has used backcasting scenarios with a two-fold purpose: to create scenarios for the future with the input of workers at different levels of the organization and to design reasonable pathways for sustainable change that could then be tested in a simulated environment. It also aimed at demonstrating the potential of this technique to

the organizational leaders in creating a context in which workers can have autonomy and the feeling of control and influence over what is being done in the organization in promoting sustainable everyday practices. It also showed the wealth of ideas that can be generated and the creative potential of using back-casting in designing the strategies for organizational change.

We have presented here two different approaches to back-casting. The one used for the University of A Coruña was a participatory approach, thus fulfilling the criteria for generating the conditions in which workers can actually feel empowered to contribute to change and can become engaged and motivated to actually carry out actions for change. If workers are involved in this process, some of the conditions for spillover of practices from work to home are thus met, such as the strengthening of environmental self-identity by being engaged in the efforts for change, which in turn would lead to more pro-environmental behavior at home.

The approach used at the Municipality of Groningen had to be different due to limitations imposed by the organization. These limitations are based on a subjacent belief that participation in future visioning will not have additional benefits to what can be obtained from experts in human behavior, who can use theories to derive the conditions for behavior change. In spite of the fact that some scenarios can be derived through this method, their implementation would certainly not lead to as much commitment to goals and engagement as when workers are involved in the process of future visioning.

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Assessing the participatory potential of system mapping¹

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Abstract

The question of participation is not only an abstract theme of social or political theory since a number of practical dilemmas arise about planning and conducting participatory processes. The main issues of participation are central to questions such as who the participants are, how the participatory process is structured and what effect the outcome has on the final decision. These issues come up both when organizers decide about a particular set-up of a process and when they select their methodological approach. In the last few years, a new type of participatory method has emerged in the methodological toolbox of social sciences, in which the participants jointly develop casual loop diagrams on a given topic. Moreover, they also elaborate policy recommendations based on these cognitive models. The paper discusses an experiment of the method's adaptation to the Hungarian context and draws the main conclusions in terms of its participatory potential.

Keywords: participation, system dynamics, system mapping, sustainable consumption

Introduction

The paper discusses an experiment of the system mapping method's adaptation to the Hungarian context and draws the main conclusions in terms of its participatory potential. The expression of public participation in a narrow sense denotes the involvement of everyday people (Pataki, 2007; Kiss, 2012) in the deliberation of complex issues and dilemmas that have a significant impact on their lives. Behind this aim prevails the presupposition that there is no need for extensive technical knowledge in order to be able to form an opinion and decide on questions such as how heavy the traffic should be in one's neighbourhood; or whether there should be a waste incinerator, and if so, how close it should be to one's residence. The question of participation is not only an abstract theme of social or political theory. Highly practical dilemmas arise in the course of planning and conducting participatory processes. The main issues of participation can be focused

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around questions such as who the participants should be, how the participatory process should be structured and to what extent the outcome influences the final decision. These issues come up when organizers decide about a particular set-up of a process and when selecting their methodological approach.

This is why the authors believe that the sharing of practical experience regarding participatory methods based on concrete examples can lead to the improvement of the methods themselves. In this paper, the authors base their arguments on a methodological experiment conducted in Hungary in 2013 when system mapping was applied in the topic of sustainable consumption with the participation of one expert and one lay panel. This set-up allowed the authors to assess the potential advantages and drawbacks of applying system mapping in a participatory context. Moreover, one of the explicit aims of this experiment was to test the method itself in order to see whether it can be combined with the system mapping approach in a participatory context.

Hence, our paper will be structured as follows. Firstly, we will introduce the most important aspects of participation related to the questions already mentioned (who, how, what). Secondly, we will describe our methodological experiment, particularly focusing on the process and the specific methodological approach we have taken. Thirdly, we shall analyse our findings in terms of the process and the method attempting to draw general methodological conclusions. This analysis and assessment will reflect back on the aspects of participation introduced in the first part of the paper. Finally, we shall reflect on the question of how system mapping may be applied to a backcasting process. A special emphasis will be placed on the question whether participation, system mapping and the backcasting approach can be used together and if so what 'trade-offs' will be manifest in such an arrangement.

Participation and system mapping

On a theoretical level, it is relatively easy to agree and find support for the general principles of participation. However, the application of these principles may involve several risks and pitfalls. These can range from 'negligent offences' arising from methodological mistakes to the explicit manipulation of the participants. Therefore, one needs specific guidelines in order to avoid these dangers and to guarantee that participatory processes are balanced and sound both in a methodological and an ethical sense.

The *International Association for Public Participation* summarizes the core values of participation in 7 points (IAP2, 2007: see also Appendix I.). These values can be related to three key questions of participation and explicitly reflect on questions such as: (1) *who* the participants should be; (2) *how* this participation should take place; and (3) *what* the effect of a given process is to have on the final decision of the policy-makers.

As for the *who* question, those 'core values' are connected, which emphasize the thorough mapping and engagement of the affected stakeholders. This means that if someone is affected, s/he has a right to be involved and to discuss the different decisional options and to have an impact on the final decision (not only on the outcome of the participatory process). Since participatory mechanisms interpret political participation in a wider sense than elections or referenda, they aim to involve the public in a more direct and interactive manner. However, in most cases practical and organizational matters (that is the resources, funding and time available for the project) decide how many people can *actually* participate from those affected and on what level they can be involved.

As far as the *how* question is concerned, the values connected to the process itself highlight that it is paramount to brief the participants before the process, providing all the necessary information in an understandable format. It is also important that all views of those affected can appear in the process, no opinions or perspectives which stakeholders want to express are marginalized or omitted from the discussions. Furthermore, one of the most important guidelines for public participation is that those involved can influence how they want to discuss a particular issue (or question, problem or dilemma), on what aspects they want to focus on during the deliberation. This ensures that the process is not overly fixed and pre-structured which would inhibit participants from raising new themes or dilemmas during their deliberation.

Values related to the *what* question underline that in the case of a participatory process it is a legitimate expectation that participants have an impact on the final decision and participants are informed about how the outcome of the process shaped the decision. Of course, this does not mean that those involved would become an independent body with a power to decide on important matters for the whole community. In most cases, the result of these procedures has the function to assist and support the process of decision-making. Moreover, the impact may vary from case to case, and it is advisable to choose methodology according to the role the results will play in the decision-making process (i.e. voting conference or deliberative polling can be disastrous if held without the commitment of public officials). Nevertheless, what is essential in all these cases, is that the participant should know beforehand what kind of impact the participatory event will probably have so as to avoid potential disappointment and escalating frustration during and/or after a particular process (Király, in press).

In the last few years a new type of participatory approach has appeared in the methodological toolbox of social sciences. This new approach allows participants to jointly develop complex cognitive models using casual loop diagrams in a given topic and they develop their recommendations based on these models. The potential advantages of this methodological approach of system mapping can be related to its four distinctive characteristics. Firstly, it is inherently explorative in nature since through the visualization of casual relationships and feedback loops it helps to deepen the understanding of a group about a situation (Vennix, 1999). Secondly, since it focuses on variables and their relationships, it provides a neutral communication tool which allows for a dialogue between parties with different types of knowledge (either between experts having different disciplinary perspectives or between experts and lay people) (Sedlacko, 2011). Thirdly, it makes the documentation and tracking of the thinking process relatively easy (Stave, 2002) since the different versions of system maps of the subsequent thinking phases can be effortlessly presented on a few sheets of paper and/or photos after the process. And last but not least, this 'structured thinking style' can be easily acquired and taught, no special training is needed for using it (Forrester, 1992, 2007).

Participatory system mapping for sustainable consumption – a Hungarian methodological example

The research this paper wishes to depict was commissioned by the National Sustainable Development Council, the body of the Hungarian Assembly that coordinates and supports policy aims and measures with regard to sustainable development. In the last couple of years, the so-called de-growth debate has introduced a completely novel perspective into economic discussions and the National Sustainable Development Council also considers the exploration of possible alternative policies crucial. This, however, means that besides

scientific theory building, research requires practice-oriented approaches that uncover ways to exploit the potential of the de-growth economy. The research aimed at finding out more about the constructed mental models of participants on the topic of sustainable consumption, a key concept in the de-growth paradigm. By discovering the cognitive constructions of sustainable consumption, the research was also able to identify policy measures that may not have been exploited in the past².

The researchers set up two panels for the two workshops that took place in April 2013: an expert panel and a lay panel. The reason behind this choice was to exploit the differences these two groups may have in their approaches and to make use of the fact that such dissimilarities can also contribute greatly to adequate conclusions. The expert panel consisted of nine people, whose work is strongly linked to the topic of sustainable consumption or sustainability in general either in the public, civil, scientific or corporate sectors. Even though the opinion of each expert may have been published in some form beforehand, the participatory method enables them to find common grounds during the process. However, the mapping of the lay knowledge was also indispensable as at the end of the day they are the ones who “live with” sustainable consumption and hence, their opinion is highly relevant in the policy context.

The methodological choice of the research, namely, system mapping is a relatively novel experience in the area of sustainable consumption. As discussed before, system dynamics investigations normally aim at modelling complex systems within a given timeframe. Within the area of system dynamics, our research devised complex causality diagrams with a participatory approach, using the contribution of the expert and the lay panel. As our first diagram indicates, the process itself followed the logic of a typical participatory method: its course running from the phase of framing and establishing the cornerstones of the topic towards more concrete recommendations that can serve as serious inputs into policy-making.

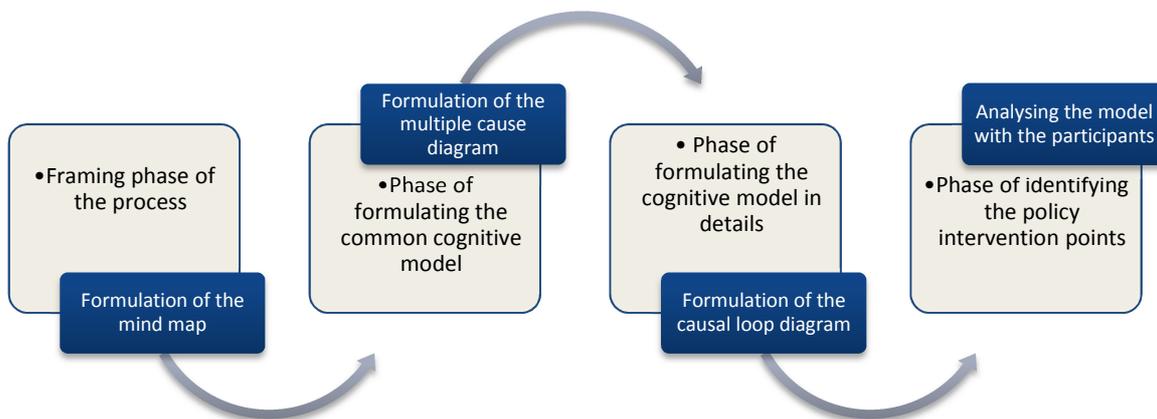


Diagram 1: Phases of the participatory system mapping process

As the diagram also shows, the process differed from other participatory methods in one regard, that is, the subsequent phases all involved the devising of a certain type of

² As our paper focuses on the methodological issues of the research, due to our limitation of scope we do not discuss the workshop results and policy suggestions. The final research study covers these aspects in great length (Pataki et al., 2013).

diagram. Hence, the resulting diagrams reflect how the thinking of the participants moved from a more diffused, associative brain-storming towards more formal constructions that concentrated on causality relationships. The three diagram types that were used during the workshop were a) a mind map; b) a multiple cause diagram; and c) a causal loop diagram (sign graph). The first two served as a preparatory phase to the formulation of the causal loop diagram and the identification of possible intervention points. Below we will describe the research method using these three diagrams. The types of diagrams will be introduced with the help of the resulting diagrams of the lay panel but due to scope constraints, we will refrain from analysing the contents of the diagrams.

The application of the mind map

The function of the mind map within the process was to discover the associative space around the topic of sustainable consumption and it was used for framing the subject. Mind maps are tools that are widely used as they have the advantage of applying both hierarchical and associative cognitive styles, as they uncover the associative space around one central topic in such a way that the thoughts occurring around one notion become the focus points for further thoughts (Wheeldon-Ahlberg, 2012).

During the process, the participants first devised their own mind maps centred around the topic of sustainable consumption, and later they tried to connect their maps by identifying the common elements. Therefore, at the end of this stage, a common mind map of the participants emerged (see diagram 2.) and this served not only as an initial exercise for putting them in the right frame of mind but also as a starting point for deliberating which aspect of sustainable consumption they wish to focus on during the rest of the process.

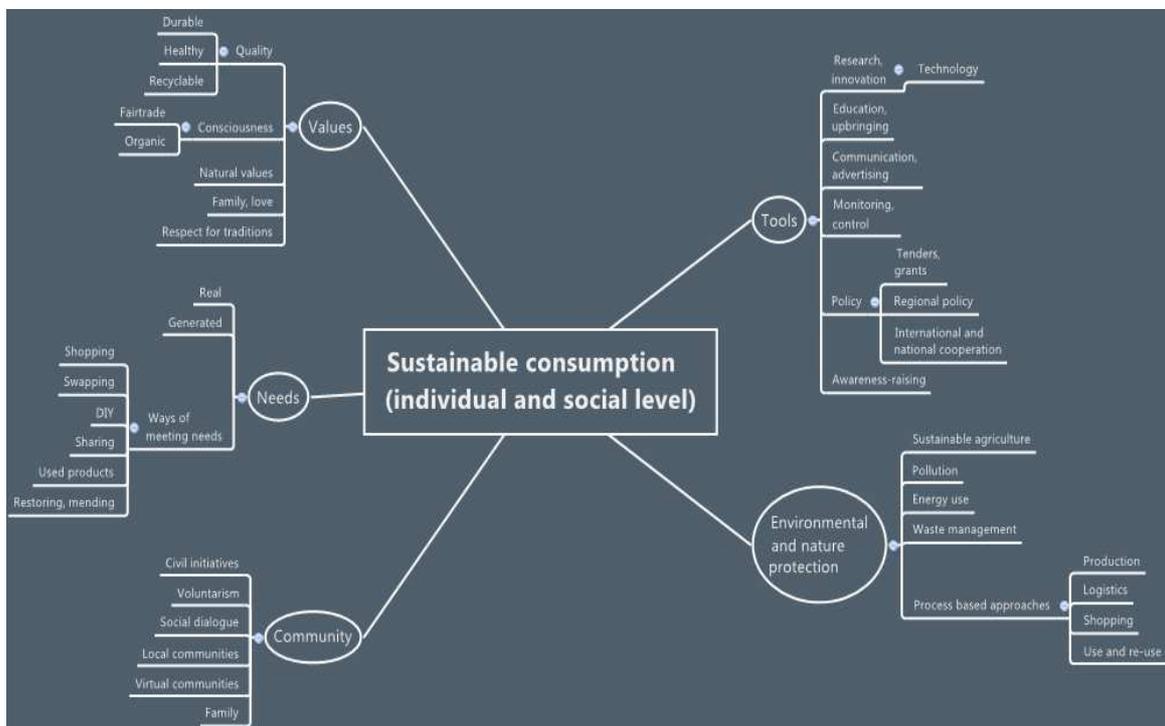


Diagram 2: The mind map of the lay panel

The application of the multiple cause diagram

The use of the second type of diagram, the multiple cause diagram facilitated the formulation of the network of cause and effects that trigger an event, maintain a state or aggravate a situation (The Open University, web). The most important rules when applying the multiple cause diagram are that all relationships must describe causal relationships, and the direction of cause and effect must be correctly identified. Accordingly, the causal structure must be outlined to an adequate depth of details and also the feedback loops must be identifiable. First, the event or state must be precisely described; then the network of cause and effect must be formulated around the event or state; and finally the relationships and potential loops must be identified. During the participatory process, the multiple cause diagrams were used in order to loosely describe the situation concerning sustainable consumption as well as to facilitate deliberation of the differing viewpoints of participants. This diagram also served as a base for the formulation of the causal loop diagram.

The participants of the lay panel picked the subtopic of “the role of community” from the emerging five main topics of the mind map, and hence all later diagrams (including the multiple cause diagram) focused on understanding in more depth this narrower theme by uncovering the structure underlying this topic. The members of the panel also determined the level of analysis where they concentrated their diagrams. They decided that they would want to determine the basic relationship of sustainable consumption and communities on a local level. Hence, at this stage the central issue was what notions lead to the occurrence of a given situation, i.e. in our case it was what causes lead to the development of a strong community. The following diagram shows the result of this cognitive phase in the lay panel.

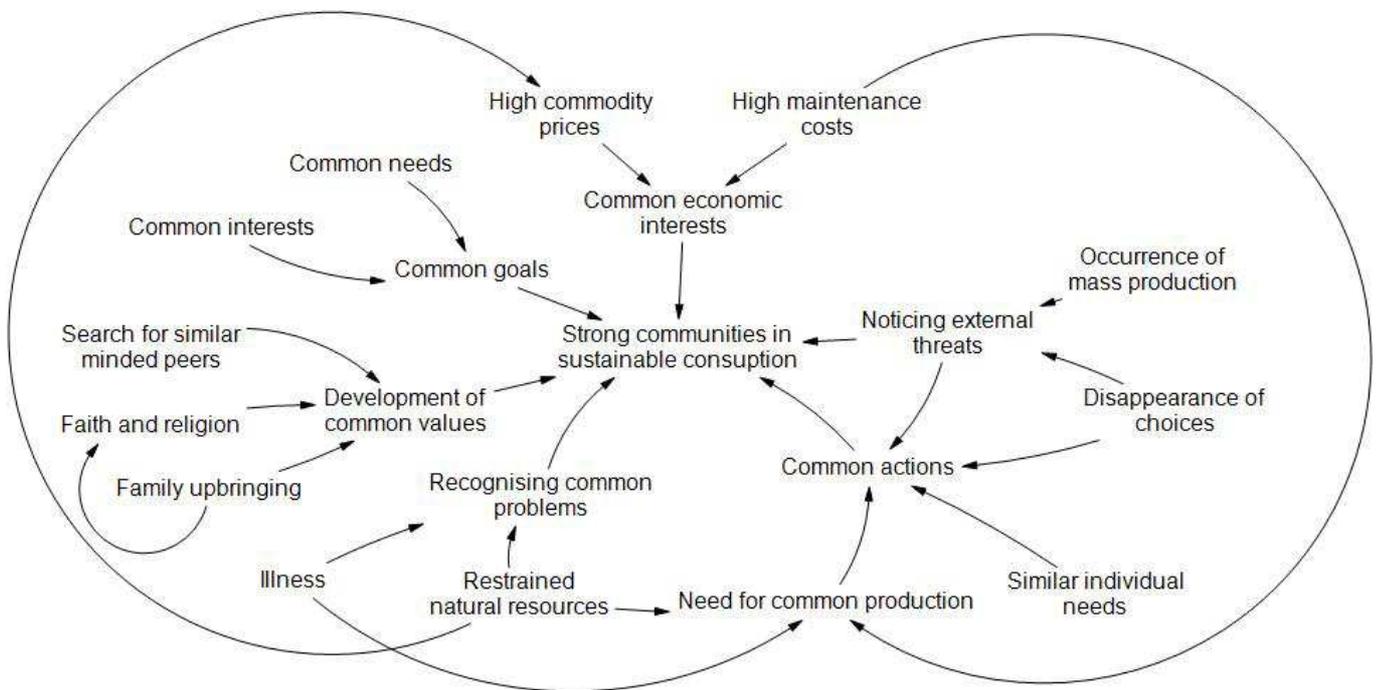


Diagram 3: Strong communities in sustainable consumption – multiple cause diagram

In order to get a clear-cut and straightforward final diagram, the process required a large number of sketches. In order to avoid repeatedly redrawing the diagram and the notions within the diagram, the participants used post-it stickers for each notions and this enabled

them to introduce new ones or freely move the existing ones around in the abstract space if the reorganisation became unavoidable.

The application of the causal loop diagram

The third and final diagram used during the workshops was the causal loop diagram that in many ways overlaps with the multiple cause diagram as both reflect essentially the same causality logic and both aim at uncovering and depicting the network of reciprocally interconnected causes and effects within one system. However, there are important differences between the two diagrams. The causal loop diagram is a stricter and more precisely defined model of the situation. Turning a multiple cause diagram into a causal loop diagram requires the elimination of all prevarication in the phrasing of any notion and in the definition of relationships, and hence the latter reflects more precisely the understanding of the situation by the individual or the group (Sedlacko, 2011). Putting it differently, the multiple cause diagram is suitable for a freer analysis of the situation, while the causal loop diagram provides a clearer scrutiny of the circumstances. This is the reason why the models that occur in these diagrams can be more easily utilised in computer simulations, and in the framing and analysis of formal hypotheses (Morecroft, 2010).

Further distinction of the causal loop diagram is the appearance of signs in the arrows that describe relationships and the formulation of the variables that occur in the diagram. In causal loop diagrams, the arrows have '+' or '-' signs assigned to them that indicate whether the two variables move in the same or in opposing directions. Another important difference is that while on the multiple cause diagram states or events designate the causes and effects, on causal loop diagrams these states or events are formulated as theoretically quantifiable variables that change over time (The Open University, web). Even though both types of diagrams can adequately identify feedback loops, in more complex cases, the causal loop diagram is more suitable for distinguishing between self-reinforcing (positive) and self-restraining (negative) loops (Haraldsson, 2000).

All of the above indicate that the translation process of a multiple cause diagram into a causal loop diagram requires three consecutive steps: the precise phrasing of the variables (if possible with the classification of the units of measure); the identification of the direction of relationships (whether the variables move in the same or in opposite directions); and the recognition whether the feedback loops are self-reinforcing or self-restraining (whether the overall polarity of the loop is negative or positive by summing up the polarity of the individual relationships within the loop). The following diagram shows the resulting causal loop diagram of the lay panel.

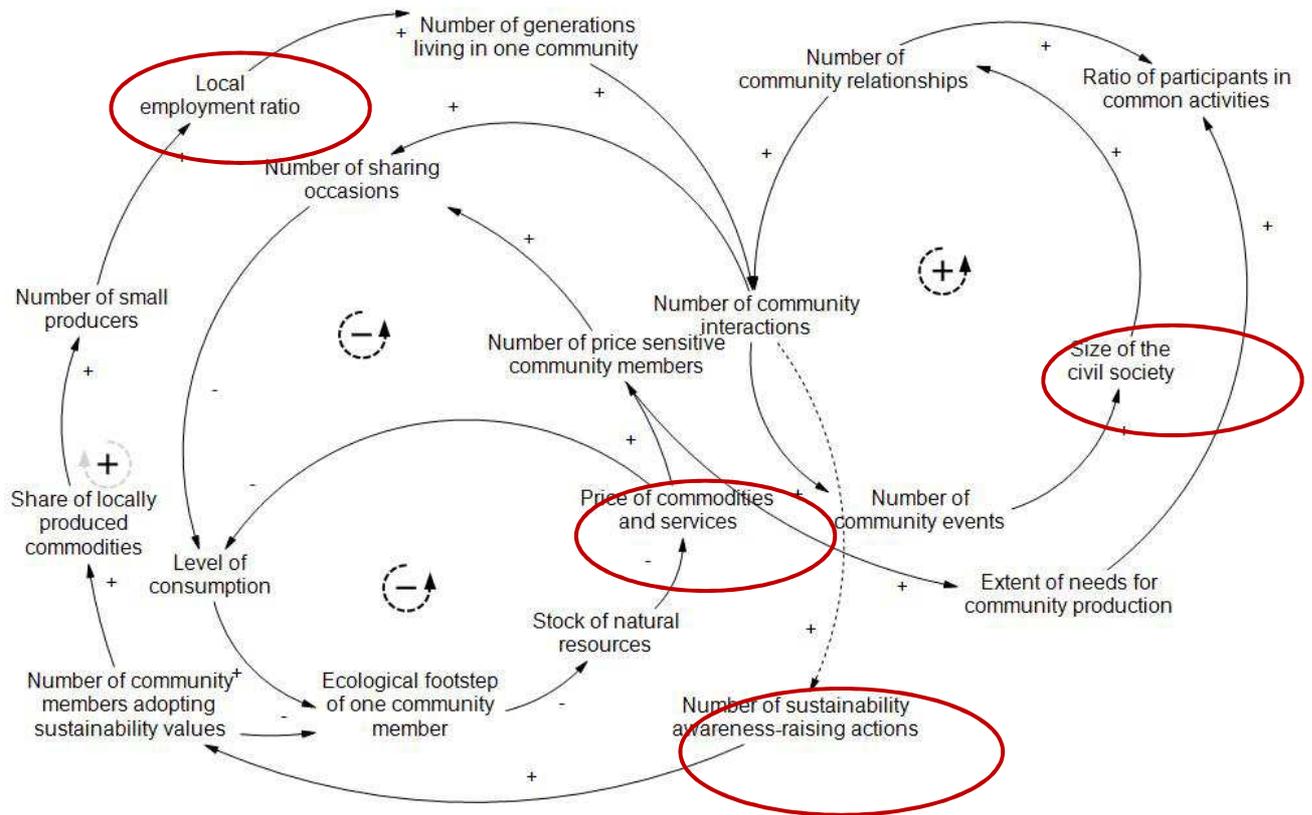


Diagram 4: Resulting causal loop diagram of the system mapping exercise of the lay panel and the identification of the most important intervention points

After drawing up the causal loop diagram, the participants examined the different relationships and analysed what policy measures would have a positive effect on the variables identified as ideal intervention points that, in turn, would lead to more sustainable consumption. Hence, the policy measures are related to individual variables whereby the positive influencing of the given variable would have an impact on the dynamics of the whole system. It is interesting how at this point some of the participants emphasised how local communities must be regarded as self-regulating systems, where external intervention is unnecessary. Consequently, the presumption of the endogenous nature of such systems occurred in the group spontaneously, without the suggestion of the researchers.

Discussions: assessment of participatory system mapping

The previous chapter has shown how the system dynamics approach can be combined with participatory methods. Even though this combination does not go back a long way, and especially in social sciences it lacks substantial history, from the literature certain traits already emerge. Firstly, participatory system mapping is suitable for discovering background contexts which proves especially useful when a wide array of knowledge is needed in order to understand complex problems. Secondly, through visualisation it provides a neutral communication technique for experts and lay experts coming from different disciplinary backgrounds. Thirdly, it has the advantage of recording the thought processes along the way, making analysis easier. Lastly, – according to the literature – the method is easy to teach and easy to learn. The first part of this discussion will provide an overview of the experience gained through the Hungarian experiment with regard to the aforementioned potential advantages.

The Hungarian research has also confirmed that participatory system mapping can indeed lead to new perspectives of certain issues that had not at all or only to a small extent been discussed in preceding literature. An example for that is how the lay panel has chosen the role of strong local communities as the focal point for their examination of sustainable consumption. Even though this approach does appear in the literature, there it has highly different initial axioms.

Our experience has also substantiated the hypothesis found in the related literature claiming that the method provides a neutral communication tool. The expert panel consisted of participants coming from highly diverse backgrounds (civil sector, public sector, business and higher education), and still they found those solutions relatively easily that are capable of reflecting the common standpoint.

The advantage of being able to follow the train of thoughts with relative ease after the workshops through the resulting diagrams can also be confirmed. From the previous chapter it is apparent how the consecutive diagrams indicate the introduction of new elements during the process or how elements that were highly stressed at the beginning of the thinking process lose their importance. In our experience, this transparency of the cognitive process introduced through the constant visualisation and the fact that at the end of the process the participants were able to see the whole model with the help of an IT application, has provided substantial support to the participants as well.

However, the Hungarian experiment has not substantiated the previous expectations that this method is easy to teach and easy to learn. While the language of the method is relatively easy to understand, and through simpler examples the participants comprehend quickly what is expected of them, the constrained way of systems thinking that the method requires did not come naturally to many participants in spite of the preparatory exercises. Most of the difficulties arose when participants had to establish the causal relationships within the complex system (as effects can act as causes in other relationships); when they had to translate highly complicated social notions into simple variables and when they had to transcend their “everything is related to everything” ways of thinking and only handle the most important elements within the complex system.

In addition to the methodological evaluation of the system mapping, it is worth discussing the experiment with regard to its participatory nature. The most important preconditions for participatory techniques can be grouped around three foci. The first places the stakeholders in focus and evaluates the method from the perspective of how well suited it is for people with different backgrounds, uneven knowledge and from diverse circumstances. The second concerns the process itself and how it constrains the participants’ thinking into pre-established cognitive frames or, in other words, whether the participants are given the freedom to introduce new topics and/or cognitive frames. The third issue of the participatory nature is the influence the process has on the final decision or the final policy. In the next part of the discussions, we will examine the Hungarian experience along these perspectives.

From the perspective of stakeholders, it can be stated that participatory system mapping is not necessarily a method that can involve all levels of lay knowledge. In our research both the expert and the lay panel consisted of highly educated individuals and especially in the light of the previous findings, the Hungarian experience confirmed that this method is not necessarily suitable for the involvement of stakeholders with lower knowledge capital. This pinpoints one of the limitations of the method with regard to the participatory nature. If the topic requires the involvement of stakeholders with lower educational background,

it is suggested that the method used in organisational development is followed, namely that the researcher/consultant organises a round of focused group interviews and then prepares the system mapping based on the variables identified by the group. In the second round, the researchers can present the findings and provide an opportunity for the participants to comment and initiate modifications if they deem it necessary. This alteration, however, raises the question whether this approach can be termed as participatory and who is the real owner of the final model (Prell et al., 2007).

When setting up the two groups in our own research, involving expert and lay knowledge has contributed significantly in uncovering many perspectives in our understanding of the general topic as both groups enhanced our comprehension differently. With regard to the dynamics of the two groups, the lay panel found it easier to start a dialogue as they did not need to distance themselves from the organisations they represent and could act as individuals representing their own thoughts. At the same time, the expert panel could bring in more professional experience that, on the one hand, contributed to a wider array of approaches but on the other hand, the extent of their knowledge of the topic made it even more difficult to simplify the complexity of the issue in diagrams.

Regarding the process itself, – bearing in mind the basic requirements of a participatory approach – the organisers laid a great deal of emphasis on enabling the participants to follow their own choices in which topic they wished to cover at the different stages of the process. This endeavour does not only cover the planning of the process but also the choosing of the adequate moderation style facilitating this participatory nature. In our experience, the moderator needs to be more active than for example in the case of focus group interviews (due to the requirement to translate thoughts into the language of causality), but his influence on the participants should be less than for example in the case of a citizens jury (as most of the time the participants work on their diagrams on their own). In this particular case, the briefing stage (that is normally part of participatory processes) was left out as the topic itself relied on the everyday knowledge of the participants and any additional information brought in by the researchers would only have unnecessarily influenced the participants. The briefing was also unnecessary as it would have narrowed the topic itself. However, this does not imply that a system mapping on a different topic would not require a briefing stage.

The process built on three consecutive diagrams has confirmed the previous expectations and helped in constructing the cognitive process. However, the second phase, the drafting of the multiple cause diagram proved to be the hardest part of the process. Nonetheless, it would be difficult to assess how much this lengthy and difficult phase contributed to the relatively smooth construction of the causal loop diagram. The length of the whole process roughly fits in a long work day as the method described in this paper requires a net time of 8-9 hours. The net time in the Hungarian experiment was only 7 hours but the drafting of the final policy recommendations would have required slightly more time. However, it is an advantage of the method that the participatory workshops can fit into one day each as that has a positive impact both on the costs of the research and the availability of participants.

The use of post-it stickers for the facilitation of introducing modifications in the models under discussion has proven to be a highly useful solution as it has made the participation interactive since all participants were able to sit around one table, write and add a new thought or move a sticker to prove a point. The same interactivity could not have been ensured with the use of a computer and hence some of the involvement of the participants would have been lost. At the same time, one of the researchers used an IT application in

the background to draw the results that not only helped in reconstructing the phases of the thinking process but also enabled the researchers to show the participants the final results at the end of the day. This simple action seemed to have given the participants great satisfaction having seen a clear version of their day's work.

This experiment is difficult to assess from the perspective of how far this participatory event has contributed to the final decisions. On the one hand, this research was part of a social experiment that introduced alternative solutions both in its methodology and in its final policy suggestions to decision-makers. On the other hand, the final policy recommendations can be used more as inputs into future strategies rather than background material for immediate action. Nonetheless, it has become clear from this experiment as well that due to their clarity and easy comprehension, the resulting diagrams of the system mapping are useful tools to convey complex ideas to decision-makers. The contribution of the participatory system mapping to the final decision is also obviously largely dependent on the decision-makers' recognition of the importance of deliberation.

In general, it can be stated that the Hungarian experiment has proven that the system mapping approach suited the logic of the participants and could be used for further social research. Combining system mapping and the participatory approach enables the integration of different knowledge and helps synthesising comprehension on a given topic. As for the limitation of the method, it should be noted that this method structures associative and free-flowing thinking and simplifies reality that can lead to the loss of valuable ideas. Nonetheless, the method is capable of bringing in and integrating thoughts and directions away from the mainstream as long as the participants can also integrate them in their own cognitive schemes. Therefore, the method can support decision-makers in identifying and moving towards alternative solutions that may encounter less resistance and this may prove useful in socially sensitive policy areas. However, in order to exploit this advantage, adequate participatory approach is indispensable.

Future research aspirations: the combination of system mapping and backcasting

In this last section of the paper we reflect upon the potential combination of system mapping and backcasting practices. In many aspects, the methodological 'cross-breeding' of these different approaches seems very constructive and fruitful. System mapping can bring a more rigorous and focused cognitive style to oftentimes vague and diffuse discussions about the future. Moreover, a systematic analysis would possibly make the actual 'backcasting phase' (i.e. connecting normative future vision with the present by identifying the necessary policy steps) easier if the issue is seen on a single sheet of paper and the intervention points can be identified in a casual web of interrelated factors. Different versions of system maps can also represent different snapshots in time making changes traceable and observable for participants.

However, we would argue that although an 'arranged marriage' might bring several assets and new insights, there are several constraints which have to be dealt with if such a match happens. Our intention is not to show that this combination is impossible but to pinpoint some problematic points in order to instigate discussion and debate on how to overcome them. Related to the assessment of system mapping in a participatory context above, three problem-areas or constraints can be identified. These are as follows: (a) the constraint regarding the scope of potential participants, (b) cognitive constraints, (c) the constraint

on the type of backcasting utilized. We shall present these constraints in the above sequence.

As far as the constraints regarding the scope of *potential participants* are concerned, it can be argued that utilizing system mapping in a backcasting process might exclude lay people with a lower knowledge capital. Our experience with system mapping has not proven our presupposition that it is easy to acquire the necessary skills to utilize this thinking style for adults who are not researchers or other experts familiar with its basic concepts. Thinking in variables and casual mechanisms in a formal way is very difficult for those who meet with the concepts of variables and causality for the first time. Thus some kind of familiarity with basic concepts would be required at least at a tertiary level of education from the participants. Viewing this question sociologically, it means that a large part of our societies would have serious problems with using system mapping in backcasting. If we understand participation in its narrowest sense (involving the members of the public and not only stakeholders), this would mean that socially disadvantageous and marginalized groups in society could also be marginalized in or excluded from a backcasting process utilizing system mapping.

Even if this problem can be overcome with extensive preparation and training, one has to be aware that serious differences might remain between participants coming from different socio-economic backgrounds. The straightforward visual thinking style of system mapping can be understood as a form of language. Criticizing Habermas' ideas on the 'ideal-speech-situation' (Habermas, 1990) authors such as Bourdieu (Bourdieu, 1991), Foucault (Foucault, 1971) or Mouffe (1999) point out that certain social actors will always use language in a more eloquent, fluent and expressive way creating unequal power relations in the discourse itself. This is also a considerable risk when one utilizes the visual semanticity of system mapping in a participatory backcasting process.

Secondly, there are considerable *cognitive constraints* in connection with the joint application of backcasting and system mapping. Our experience (Köves et al., 2013; Király et al., 2013) with backcasting showed that it involves a way of thinking which runs contrary to the time perspective used in everyday thinking. While participants might jointly develop a future normative vision relatively easily, the actual 'backcasting', the phase of the process in which they attempt to connect this vision with the present is very challenging and mentally exhausting. As we argued above, utilizing system mapping also requires considerable mental effort. Therefore, combining the two methodological approaches might be cognitively overtaxing³ for the participants and it is possible that they cannot be applied together for long periods of time (i.e. 7-8 hours a day). That means that the process has to be structured in a way that participants have enough 'breathing time'. This would mean longer processes with intense periods of joint thinking sessions, yet longer events also require more funding and more time of the participants.

Lastly, the constraint of the *type of backcasting* utilized is also worth mentioning. Backcasting is not a methodologically unified approach since there are different types of backcasting practices. Wangel (Wangel, 2011, 874) drawing on Börjeson et al.'s typology

³There is also a possibility that the two thinking styles might be in conflict also at a cognitive level. In other words, they use different timeframes: system mapping uses the habitual timeframe (time flowing forward), while backcasting challenges, and reverses this timeframe. Cognitive psychological experiments (Móra, 2003) show that it is extremely difficult to use deduction backwards in relation to casual mechanisms. This inconsistency of time frames might cause an additional problem in practice although experiments are needed whether this is only a problem appearing in laboratory context or it would be present also in the practice of a backcasting process.

(Börjeson et al., 2006) presents three types of backcasting processes (target-, pathway-, action-orientated backcasting).⁴ There is not enough space here to extensively describe these backcasting approaches so we only briefly touch upon their differences in focus. Our main point is that the explorative nature of system mapping is most compatible with the explorative approach of pathway-orientated backcasting (focusing both on what can change and how to change it). In contrast, system mapping's holistic and structural approach might be at odds with target-orientated (focusing on what can change to reach a specific goal for example 30% reduction in CO₂ emission) and action-orientated backcasting (who could make the change happen). It can be argued that system mapping's holistic approach (The Open University, *web*), focusing on a web of interconnected causes rather than single cause-effect relationships, does not match with the target-orientated backcasting's strong focus on a single goal. In a similar fashion, system mapping is structural (Morecroft, 2010) in orientation although not in the sense of structural functionalism (Parsons, 1966) or general systems theory (Laszlo & Krippner, 1989). While it does not aim to describe a stable homeostatic system, it attempts to shift focus from actors and narratives (Meadows, 2008) to the underlying structure of sudden and gradual changes. That implies that there is a mismatch between system mapping's specific perspective and action-orientated backcasting's focus on key actors who instigate change.

Considerable back office activities might provide solutions to both the constraint of potential participants and the constraint of possible cognitive efforts. Organizers can gather input from participants and, not unlike the process of soft system methodology (Checkland, 1989), they can elaborate system maps that provide inputs for participants to work with throughout the rest of the event. This would both alleviate the issue of cognitive overburdening of the participants and, in a sense, level out the social differences among them. However, in this case the legitimacy of the process's participatory nature can be questioned and challenged. It seems there is a serious 'trade-off' to be considered if one aims to utilize system mapping within backcasting.

As for the last constraint, one might argue that not every tool fits every toolbox, that is, system mapping might not be compatible with all the types of backcasting processes. In our opinion the explorative nature of system mapping might fit the explorative type of pathway-orientated backcasting the best. However, this may remain an open question since careful experimentation with the 'cross-breeding' of the different processes and methodologies might produce different results in the future.

All in all, in order to use backcasting and system mapping in a participatory context, these problem areas have to be reflected upon and certain solutions have to be developed to deal with them. Again, we would like to emphasize that it was not our aim in this paper to prove that system mapping and backcasting cannot go together but to highlight potential pitfalls and risks involved in such a match. This reflection is especially important for us since our future research aspirations also include experimentation with such an 'arranged methodological marriage'.

⁴There is also fourth type of backcasting in Wangel's typology although it cannot be totally separated from the others. Participation-orientated backcasting attempts to involve and empower the public and in this fashion can be combined with the other three types (Wangel, 2011, 874).

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Appendix I.

„Core Values for the Practice of Public Participation

1. Public participation is based on the belief that those who are affected by a decision have a right to be involved in the decision-making process.
2. Public participation includes the promise that the public's contribution will influence the decision.
3. Public participation promotes sustainable decisions by recognizing and communicating the needs and interests of all participants, including decision makers.
4. Public participation seeks out and facilitates the involvement of those potentially affected by a decision.
5. Public participation seeks input from participants in designing how they participate.
6. Public participation provides participants with the information they need to participate in a meaningful way.
7. Public participation communicates to participants how their input affected the decision.

(IAP2, 2007)“

Discussion Report

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Moderator: Jaco Quist, Delft University of Technology

Organisation

The working session on backcasting, scenario analysis and pathway development was moderated by Jaco Quist from Delft University of Technology and was organized as follows:

- First, there were 10 minute presentations by (1) Gábor Király *et al.* on their paper entitled '*Assessing the participatory potential of system mapping*', and (2), Adina Dumitru *et al.* on their paper '*Pathways to sustainable change in organisations*' which are both included in these proceedings. Therefore, only the discussion is summarised.
- Second, there was a moderated group discussion in which participants shared their experiences and knowledge on backcasting, scenarios and pathways. The following questions were guiding the discussion:
 - What are your experiences with backcasting, normative scenarios & pathway development for sustainable lifestyles & communities?
 - In what projects did you do that and what were main results & outcomes? What does it contribute to the state of the art in the session theme?
 - What are main strengths, bottlenecks and what topic deserves further development and testing?

Main discussion points on the paper by Kiraly et al.

The paper by Kiraly reports on using participatory system mapping in a backcasting approach that focuses on targets, and putting pathways into action. In this method participants jointly develop casual loop diagrams on a given topic, while they also elaborate policy recommendations based on these diagrams and their underlying cognitive models. It was asked whether non-causal relationships, like for example people's relationship to nature, were also included in the system mapping as they are also important. The author acknowledged that the rigidity of system mapping does not allow to include this kind of relationships.

On the other hand, the potential of system mapping was put forward as a way to help backcasting participants to find the steps that connect the vision with the present. G. García-Mira commented that conceptual maps also help to reveal what people are concerned about, and how information is structured in their minds.

Main discussion points on the paper by Dumitru et al.

The paper by Dumitru et al deals with the role of participatory back-casting in organisations, which ensures workers' autonomy and control and stimulates transfer of more sustainable practices between work and private life. The discussion revolved around the reticence of certain organisations to take part in backcasting exercises. It was mentioned that intellectual property reasons make private organization reluctant to participate and share ideas and information. The research reported on in the paper did not succeed in involving a major oil company in developing visions and doing backcasting, because this multination was not only concerned about providing the data as well as they have their own scenarios about energy futures. The author also noted the difficulty of convincing certain stakeholders of the usefulness of backcasting. For instance, the authors did not manage to convince a major municipality in the Netherlands to do a full backcasting exercise as the Municipality believed scenarios could be drawn based on human behavior models.

Results from the moderated discussion

Gabor Kiraly has been involved in a project in Hungary in which backcasting has been applied to sustainable employment and mentions that envisioning sustainable employment is complicated.

Ricardo Garcia Mira has as a main concern how to use criteria in future steps and mentions the atlas technique as a method to know more about what people have on their mind.

Georgina Guilen mentions briefly the BIG2050 project on which she presented earlier in the workshop, but also refers to different terms that are around for pathways like roadmaps, pathways and strategic plans that can give confusion among participants and practitioners.

Julia Backhaus mentions her involvement in the FP7 funded SPREAD project in which backcasting has been applied to sustainable lifestyles. In this project designers were involved to generate creative images of the future that stimulated workshop participants to detach from the present. Involving industrial designer stimulated creativity greatly, but gave also focus on products in the future visions.

Walter Wehrmeyer refers to a project on long-term futures for small island states in which it was a major challenge to get participants out of their comfort zone.

Elena Iacovidou refers to the CRISP project and mentions that young adults were very capable of identifying changes needed to become sustainable, but that at the same time they were more skeptical whether they could change their own behavior is part of such changes.

Felix Rauschmeyer mentions that he has limited experience on backcasting and pathways with groups, but that he has considerable experience on capacity building and personal coaching for individuals in which he uses needs concept of Max Neef as well as guided

imagination exercises, which can be interesting extensions to the existing workshop tool repertoire. Other people refer to the dragon dreaming tool that can be used for this too.

Carmen Vercauteren refers to her personal experiences as a member of a Transition Town group in the city of the Hague and mentions that vision development and turning it into action can be quite complicated in such groups.

Freija van Duijne raises the issue how to deal in case there are several or different visions and mentions reflexive monitoring as a method to evaluate outcomes of multi-stakeholder visioning processes.

Finally, Jaco Quist mentions that generating visions and involving stakeholders is complex, and that good results have been achieved like the examples in the sessions proof, but that the real difficulty is to realize implementation and broader spin-offs. Furthermore, there are various ways of generating visions, such as through elaboration of ideas, using creativity, or by pursuing consensus, or seeking diversity.

Main discussion points

The challenges posed by participatory vision and pathway building were a major discussion point as several persons pointed out that participants tend not to be comfortable with the exercise of envisioning. Walter Wehrmeyer emphasized the importance of playing with participants' comfort zone and finding ways to bring them out of it without being too brusque. Freija van Duijne, Felix Rauschmayer and Georgina Guillen suggested that, to face poor visioning skills, creativity could be stimulated by the use of dreaming and imagination exercises. Techniques that have proved to be useful are designing a "dreaming contest" and using visual stimulation (e.g. by showing the evolution of computers from their creation up to now). We could also borrow techniques that are already used in businesses like for example the "dragon dreaming technique" where one person starts with a vision and other people add to this vision.

The issue of discrepancy between societal visions and personal visions also came back several times on the table. Eleni Iacvovidou pointed out that backcasting participants can see drastic social changes needed for the future but when it comes to changes in their own personal lives they are less ready to be as drastic. Carmen Vercauteren noted on the other hand, that participants may have difficulties seeing the role they can play in the vision. Felix Rauschmayer raised the question: would it be interesting to combine personal and social vision? In the context of community building this could perhaps be interesting for instance.

Another discussion point was about the evaluation of backcasting. What is the impact of backcasting? How does participatory backcasting exercises change the view of people? What do participants learn from it? Does it empower participants? Does it lead to action and change? Does it impact policies? Visions are one thing but turning them into action is

another thing. It was acknowledge that evaluation is a shortcoming in backcasting that needs more attention and that is better tackled in Transition Management approaches.

Finally, the accountability of the visions created in backcasting was also discussed. Julia Backhaus raised the concern: Who are we, as researchers, to say that the visions developed in backcasting should be guidance for society? Jaco Quist responded that the role of researchers is not to make their visions grow but to facilitate and articulate sustainability visions. Walter Wehrmeyer also noted that visions do not necessarily need to be positive to be good because policy makers find it easier to avoid something undesirable rather than construct something towards a desirable goal.

Conclusion

When finalizing the session, a number of diversities is summarized, which also call for further study and methodological development:

- With regard to involvement: expert involvement vs stakeholder involvement vs involvement by citizens and lay-people
- How to get participants out of their comfort zone: bringing creative images in the meeting vs stimulating people to make their own
- Content of visions: focusing on social and cultural changes vs technical and structural changes
- Learning by participants: individual learning vs group learning
- Defining pathways vs making a real life impact and implementation
- Diversity of several visions vs a single vision
- Backcasting within a single organization vs multi-stakeholder processes
- Emphasizing creativity & and radicalism in visions vs realism and feasibility
- Personal visions vs Societal and group visions.

4a

**Drivers and
barriers for
pathways and
transitions to
sustainable
lifestyles &
communities**

Exploring Design Thinking for Citizen Involvement and Societal Goals

Lessons from Design Thinking and Cradle-to-Cradle for Developing (Beyond) Sustainable Infrastructure with the Involvement of Citizens

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1. Extended Abstract

This paper explores what we can learn from Design Thinking for the development of sustainable infrastructure. Various authors have criticised and expressed concerns regarding the technocratic dimensions of sustainability discourses, and the resulting lack of direct citizen involvement (Hendriks & Grin 2007, Hendriks 2009, Meadowcroft 2009, Voss et al 2009). Such technocratic tendencies are especially apparent in the context of infrastructure projects, where issues of scale, safety and efficiency (are used to) justify the need for technocratic knowledge and top-down planning. Meanwhile in the empirical field, there is a resurgence of citizen-led projects and grassroots civil society initiatives for sustainable infrastructures, especially in the field of energy (Walker et al. 2010, Smith 2012, Seyfang & Haxeltine 2012). The participation by citizens -and by civil society more generally- in sustainable development is a widely debated topic in a variety of social science studies (Seyfang & Smith 2007, Hess 2009, Swyngedouw 2010, Wesselink et al. 2011).

The thematic of sustainable infrastructure and citizen involvement can be approached from many different angles. Due to the interdisciplinary and transdisciplinary nature of the debate, the state-of-the-art insights are scattered across a variety of research fields. Examples of such research fields include: urban studies (Swyngedouw & Heynen 2003, Boonstra & Boelens 2011, Mason & Whitehead 2012), infrastructure studies (Frantzeskaki and Loorbach 2010, Egyedi et al. 2012), community energy studies (Walker & Devine-

Wright 2008, Walker et al. 2010, Allen et al. 2012), sustainability transition studies (Grin et al. 2010, Markart et al. 2012) and environmental governance (Meadowcroft 1999, 2000, O’Riordan 2004). These fields often operate as relatively separated ‘inter-disciplines’, each with their own journals, conferences, academic community and epistemological positioning. This is not necessarily problematic, as long as there is dialogue between the respective fields.

1.1 The Relevance of Design Thinking

In this paper we want to contribute to this interdisciplinary and transdisciplinary dialogue by exploring what we can learn from Design Thinking regarding the development of sustainable infrastructure, including the social dimensions of sustainability such as the involvement of citizens. We argue that Design Thinking is particularly interesting for this debate, due to its ability to ‘bridge the gap’ between engineering sciences and social sciences.

Design Thinking (DT) has received significant attention for its ability to generate non-orthodox ‘solutions’ for various types of ‘problems’, both in the scientific literature (Young 2010, Burns, Cottam et al. 2006, Kimbell, Julier 2012, Manzini, Penin et al. 2010, Brown, Wyatt 2010, Plattner, Meinel et al. 2009) as well as in the popular media in design and business (Nussbaum 2007, Breen 2005, Cannell 2009, Tischler 2009, The Guardian 2010, Ante, Edwards 2006, Hostyn 2013). DT builds on traditional design skills to address social and economic issues by using the design process as a means to enable a wide range of disciplines and stakeholders (Burns, Cottam et al. 2006). DT can be characterized as a positive approach that addresses the needs of the human users, using a particular product or service. It crosses traditional boundaries between public, for-profit and non-profit sectors, because designers cooperate closely together with the potential users for which they work, enabling bottom-up solutions to emerge during a participative design process. In addition, designers are equipped with other tools than words or symbols, which allows the process to be more inclusive, intuitive and creative (Brown, Wyatt 2010).

“Design Thinking.” Its human-centric methodology integrates expertise from design, social sciences, engineering, and business. It blends an end-user focus with multidisciplinary collaboration and iterative improvement to produce innovative products, systems, and services.” (Plattner, Meinel et al. 2009, p. xiv)

While there are many fields that combine engineering and social science (e.g. socio-technical transition research and infrastructure studies), these fields have been criticised (by social scientists) for containing elements of ‘social engineering’ (e.g. Shove & Walker 2008, 2009, Duineveld et al. 2007). The concept of ‘design’ tends to be associated with such ‘social engineering’, or ‘remaking society by design’ especially when combined with sustainability discourses. We argue that this (often negative) association primarily has to do with the manner in which design approaches are applied and communicated in practice. Often, the application of design approaches is predominantly focused on the physical and ecological aspect of sustainability, typically in products, buildings or physical spaces. In that focus on the physical and ecological aspects, the more social dimension of DT is forgotten, or at least undermined. This is particularly regrettable, considering the many insights that DT has to offer regarding the inherently social challenge of involving and empowering ‘users’ i.e. citizens. In this paper, we want to make this social and empowering potential of DT more explicit, through a focused literature review.

1.2 Methodology & Structure

In order to tackle the challenge as laid out above, this paper follows a specific methodology and structure. Considering our aim to draw lessons from DT regarding the development of sustainable infrastructure in relation to citizen involvement, we focus our literature review on DT-perspectives that specifically target issues of sustainability and/or citizen involvement. Therein we make a distinction between process-oriented DT-perspectives and goal-oriented DT-perspectives.

The process-oriented DT-perspectives highlight the needs of human users and/or aim to involve them in a participatory manner. These include 'user-centred design' (Burns, Cottam et al. 2006), 'human-centred design' (Greenhouse n.d, Kimbell, Julier 2012), and 'participatory design' or 'co-design' (Burns, Cottam et al. 2006, Manzini, Rizzo 2011, Björgvinsson, Ehn et al. 2010, Sanders, Stappers 2008). Within the goal-oriented DT-perspectives, we focus on those that aim to mobilise design for dealing with global challenges and realising societal goals, including: 'socially responsible design' (Davey, Wootton et al. 2005, Cooper 2005, Melles, de Vere et al. 2011), 'design for sustainability' (Sherwin 2004, Spangenberg, Fuad-Luke et al. 2010, McDonough, Braungart 1992) and 'design for social innovation' (Manzini, Penin et al. 2010, Murray, Caulier-Grice et al. 2010, Brown, Wyatt 2010, Cipolla, Moura 2011, Hillgren, Seravalli et al. 2011).

We will start our paper with an extensive literature review of the abovementioned process-oriented and goal-oriented DT-perspectives. First, we discuss how three different design perspectives address the involvement of citizens: 1) user-centred design, 2) human-centred design and 3) participatory design. Second, we provide an overview of how different design perspectives address global societal challenges, including 1) corporate social responsibility (CSR) 2) sustainability, and 3) social innovation. Third, we distil lessons from different Design Thinking perspectives and from the specific approach of Cradle-to-Cradle (Braungart, McDonough et al. 2007, McDonough, Braungart 2002, McDonough, Braungart 2013, McDonough, Braungart 2002), regarding the development of sustainable infrastructure and citizen involvement. With this example, we aim to illustrate how a design approach incorporates elements from various design thinking perspectives, and how these elements are applied in practice and/or get lost in the practical application. The example of Cradle-to-Cradle is particularly interesting, because it pointedly illustrates how the potential social and empowering dimension of a design approach –which is implicitly ingrained in Cradle-to-Cradle design – tends to get lost or, least undermined, in its eco-focused application. Fourth, we distil lessons from DT and from the different design perspectives, and we discuss which lessons we can draw for the development of sustainable infrastructure, including the involvement of citizens. In conclusion, we summarise the main insights and identify challenges for future research.

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Supporting sustainability transitions by enhancing the human dimension via empowerment, social learning and social capital

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Abstract

In sustainability transitions, as answers to persistent problems and societal challenges, local initiatives are assumed as having an important role. Their success is supposed to be depended on a variety of drivers. Among others, social and particularly higher order learning is proposed as a key instrument to deal with uncertainties and complexity in sustainability transitions. Empowerment is forwarded as a core aim of governance approaches to facilitate sustainability transitions, due to enabling citizens to shape sustainability locally. Finally social capital is proposed as important precondition for joint local action when addressing societal challenges. This paper explores the meaning of social learning, empowerment and social capital for sustainability transitions at local scale and analyses how a development of all three factors can get facilitated by local transition management.

In a first step we define and conceptualize social learning, empowerment and social capital in the context of sustainability transitions. We then present the results of three transition management pilot projects in local communities with regard to strengthening social learning, empowerment and social capital amongst participants. In a last step the orientation of the facilitated process towards sustainability is analysed along four dimensions: environmental thinking, social thinking, interregional and inter-temporal thinking. Results show that in all three pilot projects social learning, empowerment and social capital development took place and the processes had a clear orientation towards sustainability.

Introduction

More than 20 years after the international community agreed upon sustainable development as a major principle to jointly strive for (WCED 1987, UNCED 1992) the environmental, social and economic challenges addressed by it have not lost their relevance. Rather the contrary can be stated: The impact of human actions on the earth systems reached a level where they become equivalent to a geological force (Crutzen 2002). Recent studies focussing on essential building blocks of assuring a safe operating space for humanity have revealed that human actions already have crossed thresholds for some of them (Rockström et al. 2009). Long-term societal stability and well-being will depend on pro-actively addressing environmental pressures such as climate change and impacts of resource consumption, social equity and ensuring viable economic activity that supports human flourishing.

These societal challenges are characterized as being complex, highly interrelated, are subject to uncertainties and unfold their impacts over long time horizons. Challenges are related to solving 'wicked' or 'ill-defined' problems, which are defined, perceived and valued differently and persist over time (Grin et al. 2010, Rittel & Webber 1973). Changes in societal systems, including human-nature interrelations, do appear frequently. But prevailing incremental changes nevertheless are not considered substantial enough by many scholars to cope with today's sustainability challenges (Markard et al., 2012, p. 955). Therefore transitions, as radical and structural change of societal (sub)-systems attracted large interest in the scientific community and beyond in recent years (Rotmans and Loorbach 2009: 2; Grin et al. 2010, Markard et al. 2012, Geels and Schot 2007, Berkhout et al 2004).

Transition research proposes that 'wicked' problems require a fundamental change in the structures, cultures and practices of a societal system for the system to become (more) sustainable (Frantzeskaki and Haan 2009). Transitions appear frequently, but they do not automatically lead to sustainability although an adequate facilitation, as aimed for by Transition Management, may work in favour of it (e.g. Rotmans and Loorbach 2009: 2). Rather than assuming that societal change processes can actually be 'managed' as the name 'Transition Management' (TM) implies, TM holds that sustainability transitions cannot be governed in a regular way. Due to their open-endedness, non-linearity and uncertainty they require an iterative, reflective and explorative way of governing aimed at societal learning.

Still, TM processes can contribute to transitions as radical changes. A key instrument to facilitate radical change in TM is the systematic development and empowerment of alternatives, in societal niches and by working with so called frontrunners as engaged and creative individuals (Frantzeskaki et al. 2012, Loorbach 2010). "The ultimate goal of transition management should be to influence and empower civil society in such a way that people themselves shape sustainability in their own environments, and in doing so contribute to the desired transitions to sustainability" (Loorbach 2007:284).

In the process of development and empowerment of frontrunners and niches learning plays an essential role. Participatory processes of joint deliberation and reflection, can "initiate social learning processes that go beyond individual and often predefined interests and / or values and create opportunities for a shared understanding and joint action" (Garmendia and Stagl 2010: 1713). At the individual level, social learning can contribute to empowering individuals as well as to raise their awareness and motivation for sustainability-related activities. At the niche level, learning can contribute to the development of alternative and innovative ways to jointly solve complex challenges and – indirectly and potentially - to the empowerment of the niche. Finally on a macro-level

social learning as facilitated by TM appears to be of core importance for societal systems to build up resilience as the capacity to buffer perturbations and take an active role in shaping transitions (Folke et al. 2002, Rammel. et al 2007).

As the TM methodology proposes an open-ended process it puts the concrete approach to sustainability into the hands of participating frontrunners. These frontrunners essentially shape the understanding and valuation of sustainability in the TM process (Rotmans & Loorbach 2009: 10) and therewith have a crucial role in directing the process towards sustainability. This practice that has not been without critique. Rauschmayer et al. (upcoming) e.g. draw attention to the need to design a proper process allowing to make sustainability meaningful to the frontrunners and to later critically evaluate the developed vision and understanding. They as well point out the essential role of addressing values, awareness and sustainability motivation of participants when facilitating social learning via TM.

Research background and approach

Applying Transition Management in three communities

This exploration focuses on the application of a new TM approach called community arena (e.g. Wittmayer et al 2011), which was developed as part of the EU FP 7 research project InContext. The 3-years project started in late 2010 and includes theory development, case studies and pilot projects. Within the InContext pilot projects participatory processes got applied that systematically facilitated a collective search to explore new opportunities of joint action. Building up a community arena, a protected communicative space for societal learning where participants meet outside of their usual habits and roles (Loorbach 2010), stood at the core of this process. The process used was explicitly based on deliberately defining visions for the future of the communities as well as doing a participatory back-casting to concretize steps for realizing future visions. Setting up experiments as to realize these steps was a concluding part of the pilot project processes. The processes were participatory and reflexive in nature, aiming to allow for intensive learning amongst participants. Reflexive elements included a focus on the values, needs, thinking and feeling as what was termed the “inner context” of the participants, as they were supposed to be essential drivers for behavioural change and collective actions. Community arenas can get understood as pre-niches which are not there yet. The community arena process therefore primarily focussed at the interplay of the individuals and the group.

Three concepts stood in the centre of the process-facilitation in the arenas: empowerment, social learning and social capital (for an in-depth discussion see Wittmayer et al 2013b):

The concept of **social learning** captures the processes of individual and collective experimentation and reflection. Social learning as well is connected to changes in values, assumptions and worldviews and relates to the awareness and valuation of sustainability topics in the arena process. The concept of **empowerment** captures the idea of finding (new) ways to at (I) an individual level meet needs (sustainability) and (II) a collective level make the developed visions for (sustainable) communities turn into reality. Another aspect which turned out to be of critical importance during the pilot projects with regard to the co-creation process was the development of **social capital** by building trust, good relations and networks among participants. In their interplay social learning, empowerment and a strengthened social capital are considered to be essential contributions to enhance the communities potential of shaping sustainability locally and enhancing possibilities to deal with societal challenges: via increasingly motivated and skilled arena participants which are increasingly connected and acting as a group when

experimenting with and find innovative solutions to societal challenges (cp. Wittmayer et al. upcoming for a more conceptual discussion of building blocks of communities transformative potentials). In principle the process of social learning and empowerment can contribute to realizing sustainability aims of the TM process in two basic directions: (1) participants can discover new or more effective ways of (jointly) realizing an (already) intended sustainable development and (2) participants can gain insights which make them more aware of sustainability issues and more motivated to address them in the TM process. Therefore learning processes that lead to changing values can play a core role.

The three pilot project communities are (taken from Wittmayer et al. 2013a):

Carnisse is an urban neighbourhood in the city of Rotterdam, situated at the Western coast of the Netherlands. Some 10,000 (out of Rotterdam's 600,000) inhabitants live in Carnisse. It is known as a deprived neighbourhood scoring low on a number of municipal indexes, marked by a high turnaround of inhabitants which together represent about 170 nationalities. Severe budget cuts of the municipality are threatening the continuation of social work as well as community facilities. The focus of the community arena process was on the quality of life in the neighbourhood and it was co-financed by the Dutch government. The vision is put into practice by a group that aims to re-open one of the community facilities in selfmanagement. Members of the community arena are also organising a number of deliberative meetings with different stakeholder groups.

Wolfhagen is a rural town situated in the centre of Germany in the federal state of Hesse. It comprises a core city and eleven rural districts, which leads to a high amount of commuters. The city, while being a frontrunner in the development and use of renewable energy, is marked by a vacated city centre and a decline in population (currently some 13,800 inhabitants). The focus of the community arena process was on the quality of life in the inner city. The vision process is put into practice by the arena group that aims to open a multi-faceted community centre in a historically important building in the inner city.

Finkenstein am Faaker See is located in Austria, on the border to Slovenia and Italy. It is one of the largest communities in Carinthia (one of the nine Austrian Länder). About 8,500 people live in Finkenstein - distributed over about 28 villages and settlements and divided into a Slovenian-speaking minority and a German-speaking majority. Main economic sectors are tourism and (small) industry and agriculture. The focus of the community arena process was on quality of life. The process was co-financed by the municipality of Finkenstein and the vision is put into practice through action-oriented projects or deliberative processes in a number of Working Groups, e.g. on economics, sustainability, and social issues.

The aim and structure of this paper

This paper analyses the experiences of the action research done in three pilot projects building on core synthesis documents of the project (e.g. Wittmayer et al 2013a, Wittmayer et al 2013b) as well theoretical considerations (Schäpke und Rauschmayer 2010, 2011, 2012). Our aim in this analysis is to provide insight in the empirical results of the action research done and engage in a reflective discussion with the theory. We will address the described interrelations by starting with a definition of the core concepts (empowerment, social learning and social capital) and analyse in a second step the impacts of the community arenas regarding the core concepts of empowerment, social capital and social learning. In a third step we reflect on the orientation of the pilot project processes towards contributing to sustainable development on three levels: first with

regard to raising awareness and sustainability learning in the process, second with regard to the representation of sustainability in the vision developed by the community arena and third with regard to the action already started by arena participants. Discussion and outlook form the last part of the paper.

Core concepts: social learning, empowerment and social capital

This section provides a brief overview of the relevant analytical core concepts “Empowerment”, “Social Learning” and “Social capital” and the role of values.

Empowerment

The concept of empowerment is addressed by different disciplines such as management studies, critical theory etc. in quite diverging ways. For the evaluation of the pilot studies we found Avelino’s definition (Avelino 2009, based on Thomas/Velthouse 1990) very helpful as it relates empowerment to transition theory. In this cognitive model, empowerment is seen as an increased intrinsic motivation strongly dependent on positive task assessments. The assumption is that the experience of positively fulfilled tasks leads to a person’s belief that she or he is able to direct own actions to a desired end. The concept is based on following four intrinsic ‘task assessments’ (cf. Avelino 2009: 64):

- 1 Choice: Asks whether a person's behaviour is perceived as self-determined.
- 2 Impact: to which degree people perceive their behaviour producing intended effects.
- 3 Meaningfulness: the value of the goal of the task in relation to the individual's values.
- 4 Competence: the degree to which a person can perform task activities skilfully.

The feeling of being empowered in turn depends on the way individuals evaluate their actions, attribute them to others, and think about future actions (Avelino 2009: 385). Schöpke and Rauschmayer (2011, 2012) highlight the role of values and awareness when it comes to how people ‘use’ the perceived empowerment: engaging for sustainability or not.

Social Learning

Social learning is seen as a process through which to deal with complexity and uncertainty. Although learning may be understood in different ways, at its core it involves a lasting change in the interpretive frames (belief systems, cognitive frameworks, etc.) guiding the actions of a person (Grin and Loeber 2007; Grin et al. 2010). The kind of social learning most relevant for InContext can be defined as second order learning. It indicates learning processes aiming at changes in underlying values and assumptions which contribute to the actual behaviour. Several authors have emphasised the relevance of this type of learning as a way to adapt to a continuously changing and increasingly complex environment through collaborative action and dialogue (Isaacs 1993; Schein 1993; Kofman and Senge 1993; Garmendia and Stagl 2010). Contrarily, in first order learning, fundamental assumptions, values and identities do not change (Argyris and Schön 1978; 1996). This is the simplest mode of learning and has to do with the acquisition of new cognitive knowledge. We assume that second order learning is one possible precondition for voluntary intrinsic behavioural change. The most important conditions for second order learning work are a) surprises, b) outside views, and c) safe spaces (Grin and Van de Graaf 1996; Grin and Loeber 2007). Schöpke and Rauschmayer (2012) put forth that (social)

learning can be understood as one major source of empowerment (e.g. via new skills or insights in new possibilities for action). In how far an empowerment via social learning has a positive impact on the awareness on sustainability related issues is not per se clear, but may be part of changing values and assumptions in second order learning.

Social capital

Social capital describes relationships, relations of trust, reciprocity, and exchange; the evolution of common rules; and the role of networks. It encompasses the involvement of civil society and collective action. Social capital theory provides an explanation for how individuals use their relationships with other actors in societies for their own and for the collective good (e.g. Adger 2003). Important dimensions of social capital, according to Gehmacher et al. (2006), are Bonding-Bridging-Linking. Bonding describes the relationship between people within a group, whereas bridging refers to the relation between different groups and linking to their connection to other levels (like the state or the broader public). A community arena has the potential to raise all three: bridging, bonding and linking social capital of a community and can enable the development of meaningful relations.

The relation between social capital development and sustainability is not fully straightforward, but there are some indices. Chang (2013: 232) points out the critical role of social capital to sustain and develop community initiatives and environmental protection efforts. Crompton (2010) shows that people with high intrinsic values (e.g. affection, benevolence) tend to have more and better social relations (social capital) and use less resources. The concrete relation between a development of social capital and sustainability awareness and motivation would need to get further assessed.

Empirical analysis of core concepts

This section investigates in how far the community arena process empowered participants, created learning experiences (i.e. social learning), and connected participants within their own social groups and to other groups (i.e. social capital). This section is mainly based on data from the final evaluation and the process-accompanying monitoring interviews, the participatory evaluation session, and participant observation. It reports on the perceptions of the participants in the three pilot areas (for a more in-depth analysis see Wittmayer et al. 2013b).

Making a difference: from wish to reality

Analysis of the empirical material, from the perspective of empowerment (defined as increased intrinsic motivation), shows that the community arena had positive effects on all four intrinsic 'task assessments'. Having analysed the material, we can argue that the participants self-reported that the community arena contributed to an ongoing learning and empowerment process in the pilot areas.

Regarding the 'task assessment' "choice", the fact that the process had an open agenda contributed greatly to the participants' feeling of self-determined behaviour. It gave people the feeling of being able to choose what to put on the agenda and that no certain policy agenda was "imposed" on them (which they feel is often the case). For participants of the pilot project of Carnisse, this also positively distinguished this project from other processes carried out in the neighbourhood in recent years.

In terms of the category "impact", the wish to make a difference in the local environment can be traced back to the reported motivations for joining the project, e.g. to gain a better

picture of the own living and working context (Carnisse) or to co-creating their environment (Finkenstein). Asking participants from Finkenstein in the evaluation phase if they believe they can have an impact on the local environment, most of them responded in a positive way, although there is also some scepticism. This was addressed through the learning process, emphasising that transitions occur in small steps and need time. Differing in Wolfhagen, all the participants had already gained positive experiences in different community-based processes and were (already) convinced that their actions are fruitful.

The third intrinsic ‘task assessment’ leading to empowerment is “meaningfulness” – is based on the assumption that if a project’s goal links to the ideals of the individual participants, this has an empowering effect. The scores participants gave for being able to bring in their own input and topics they felt strongly about, were good in all pilots. This positive assessment is also clearly related to the open agenda of the process as this made it possible to meet the different senses of urgency.

The ‘task assessment’ for “competence” was closely linked to the second one on “impact” as well as to the results we report in the next section about “social learning”. In summary, participants felt they can have an impact on their community, although some were also sceptical and claimed that more time, people, money, and political support would be needed. In terms of social learning, people gained competence in a series of different skills (e.g., speaking in front of many people, working together) and also changed some underlying values and assumptions (i.e. related to people with different backgrounds). All of this strengthens the perceived competence and therefore has an empowering effect.

In sum, the community arenas addressed all four task assessments – choice, impact, meaningfulness, and competence in a variety of cases. Through social learning processes, the participants’ belief that they are able to direct their actions to desired ends could at least in many cases be strengthened; thus, we can assume that empowerment took place.

Learning to change values and assumptions

In the evaluation interviews as well as in the participatory evaluation meeting, participants of all pilot projects reported several learning experiences, including first as well as second order learning. In Carnisse as well as in Finkenstein people, e.g. reported that they learned about their possible impact (see above) and their roles and the roles of others in the project. This increased awareness about the own impact lead many participants of the community arena in Finkenstein to a changed attitude towards the future in a positive way. A very important learning experience shared by all pilot project participants was the experience of working together in a respectful and constructive way even with previously unknown people and in a very diverse group. In Finkenstein people reported an increased self-reflexivity and attention in contact with other people. Some participants described themselves as being more open and having fewer prejudices in interactions with others. All learning experiences mentioned so far can be defined as second order learning processes as they all touch underlying values and assumption e.g. on the future.

These second order learning processes are complemented by more first order learning processes which centre on concrete skills. Examples for these are: speaking one’s own mind in public and speaking in front of a large group of people (e.g. 100 people), facilitating meetings, working respectfully together in diverse groups and the whole array of legal, financial and institutional know-how related to keeping open a community centre. As also mentioned above, stimulating factors for second order learning are a) surprises, b) outside views, and c) safe spaces. For all community arenas, the integration of outside

views seemed to trigger second learning in a special way. In establishing the community arena, all research teams were very attentive to building trust among the participants and especially between the participants, the research team, and local policy makers. These trust-building processes were successful in all pilots and guaranteed a safe space for fostering second order learning. Participants from Finkenstein also explicitly reported some surprises ('eureka moments') they came across during the project, e.g., the insight that some apparently individual worries (but also ideas) are shared by others.

From single individuals to connected groups

The community arenas enriched the social capital of the participants in all pilots as new relationships and networks could be established. A participant from Finkenstein described the networks: "Through the process the group got stronger than the sum of its single members." Via relationships and networks, new ways of working together for the collective as well as the individual good could be found and tested. Two aspects form the bottom line for these attempts to shape the local environment: a trusted atmosphere in the community arena as well as the insight that there is a shared understanding.

In composing the arena, all research teams specifically tried to mix people with different socio-cultural backgrounds (bridging). Although it was difficult to achieve an ethnically mixed group in Carnisse as well as in Finkenstein (see section 4), groups were quite diverse in terms of age, gender, professions, etc. This diversity was appreciated by the participants themselves as it gave them the possibility to gain new perspectives and unconventional insights, a very important condition for social learning. Participants of the community arenas also connected with other groups (linking). In Finkenstein, these were primarily policy makers (as part of the transition team) and the general public. In Carnisse, contact with other groups actively engaged in the neighbourhood and also the local government was established through an outreach event. In Wolfhagen, the group got in contact with the owner of the vacant building they identified as a possibility for the community centre.

From another point of view, bonding relationships could be established as well. People of all arenas reported appreciation of the exchange and collaboration with "like-minded" people and perceived themselves as "one group". For this perception, the vision-building process was probably decisive as it contributed a lot to a group feeling, giving the group a shared aim. In sum, social capital via "bridging", "bonding" and "linking" could be enhanced for the participants and thereby also the social capital of the communities.

Closing remarks and intermediate conclusion

Working with the instrument of the community arena brought changes in the inner context of the participating individuals: through social learning processes, changes in underlying values and assumptions occurred. People feel, for example, more able to direct their actions towards desired ends and to have an impact on their local environment – thus, they were empowered. Also, not really visible but of great importance are the variety of social contacts and connections (social capital) that were established. Three aspects were especially important in triggering changes in the inner context: The open agenda was very helpful in empowering the participants as it gave them a sense of meaningfulness and choice. The diversity of the groups was decisive for successful social learning and (bridging) social capital. Finally, the intense trust-building phase and trusted atmosphere in the small group of the community arenas established an environment conducive to learning. As all three aspects, social learning, empowerment and social capital development, got enhanced in the three pilot projects, an enhancement of the communities' transformative potential is likely. Unclear remains the relation of this

enhancement to strengthening sustainable development. As outlined above there are two basic contributions to targeting sustainability at community level possible: first via empowerment, social capital building and social learning the effectiveness of reaching already intended sustainability targets is raised, and second, sustainability as a possible target becomes more important to the participants via raising awareness and motivation. In the following we foremost investigate first, the meaning participants give to sustainability as a target of the process. The second possibility is addressed as part of the outlook on the role of value change, e.g. towards more intrinsic values, for sustainability.

Analysis: Transition and sustainability

In this step we reflect on the orientation of the pilot project processes towards contributing to sustainable development on three levels: first with regard to the representation of sustainability in the vision developed by the community arena and second with regard to the action already started by arena participants. Both is done by an analysis of the researchers. Third we report on the self-evaluation of participants on the importance of sustainability to them and the inclusion of the concept in the pilot project visions and actions, allowing for assumptions on the sustainability awareness and learning of participants.

Sustainability and concepts that matter locally

Transition processes do not automatically lead to sustainability, although an adequate facilitation may work in favour of it (e.g. Rotmans and Loorbach 2009: 2). To facilitate a community arena for sustainability, one might first want to define what sustainability means. As with many other normative concepts (e.g. justice, human rights), sustainability is in itself an inherently ambiguous and contested concept. The InContext consortium had a number of discussions on the meaning of the term, as well as on the way it should be used within the project as a whole and within the pilot projects in particular. This did not, however, lead to one fixed definition or one single idea of what sustainability means or should mean. On the contrary, a plurality of ideas persisted with common denominators, e.g. long term thinking.

A predefined sustainability goal with targets for the pilot projects would be counterproductive to the idea of having an open agenda for the process (and would have prevented empowerment for example). Because of the ambiguity of the concept, the impossibility of monitoring outcomes (such as behavioural change or its impacts on individual or community level) within a three year research project and the need for a locally emerging understanding, the community arena approach focused on sustainable development as a process (as opposed to a pre-determined ultimate goal). The processes were conceived as learning journeys which render the concept meaningful in the local context. Rather than focusing on the term and concept of sustainability, the community arena process aimed to play into local dynamics and was centred on a good quality of life for all now and in the future – herewith hoping to catch the essence of sustainability without falling into quarrels about the notion itself. The researchers operationalized the concept of sustainability in four dimensions:

- 1) environmental thinking (awareness of nature and natural resources),
- 2) social thinking (consideration and acknowledgement of self and others),
- 3) time horizon (short and long term) and
- 4) interregional thinking (connection with other parts in the world, near and far).

These dimensions of sustainability thinking were to be used in the facilitation of the processes (Wittmayer et al. 2012). For the action research practice, this meant that the

researchers provided space to the participants to decide what is important for them and for their community locally. In the discussions the four dimensions were used to motivate people thinking into directions of sustainability (for details see Wittmayer et al. 2013b). The term sustainability was thus in general not prominent in the process of the three pilots, although in Finkenstein it was more frequently used than in the other pilot projects. In order to see to what extent the four dimensions that were used in the facilitation of the process also had an influence on the outcomes of the community arena we look at two things. Firstly, we explore how the four sustainability dimensions can be traced back in the visions (see table 1) and the implementation projects of the pilot areas. Secondly we present a self-evaluation of visions and planned activities done by the pilot project participants with regard to the four sustainability dimensions.

Envisioning sustainable communities

Dimensions	Wolfhagen 2030	FinkenSTERN	Blossoming Carnisse 2030
Social thinking: consideration and acknowledgement of self and others.	Possibility to find and meet people with shared interests. Creation of networks for activities Active and lively/vital city Inclusive meeting places Reviving cultural aspects Generation-spanning living	Active cooperation of whom Teambuilding btw whom? Binding through culture Diversity Sharing with and supporting each other Independency (through science) Living together Intergenerational living Politics (transparent, cooperative) Care places Creation of participation	Living together Social relations Language and diversity Helpfulness and respect Safety Creativity: thinking beyond the conventional Activity: individually and in groups Cohesion Flexibility in choosing residence Knowledge building Inclusive meeting places Local economy, sharing and employment
Environmental thinking: awareness of nature and natural resources.	Reduction of traffic: Car sharing, riding along. Creation of green areas. Environmental friendly mobility: cycle paths, car free city? Renewable energy Greening the surrounding	Awareness of nature Preservation, development and improvement of nature Renewable energies Alternative mobility Local production Working group on sustainable development	Renewable energies Emphasize nature and how it should be treated Knowledge?? Re-use of space Greening of the neighbourhood Natural diversity Local economy
Interregional thinking: connection with other parts in the world, near and far	Role model Expansion of the cycle paths between core city and rural districts.	Role model for neighbouring regions Tourism Infrastructure/ accessibility (roads, public and private transports)	Attractive neighbourhood History building
Time horizon: ability of future generation to live the way they want	Generation specific aspects (care for elderly, childcare) Renewable energies	Renewable energies Preservation of existing resources Working group on SD including the future	Renewable energies Building renovations Connecting long term thinking and doing in the present

Table 1: Analysis of all three visions along the four dimensions of sustainability (Source: Wittmayer et al 2013b)

Drawing straightforward, meaningful conclusions on the basis of Table 1 is problematic. The researchers used the prompting of the four dimensions in their facilitation in a flexible way and not in a way that makes direct comparison possible – also in this table we only compared the vision documents and did not include an analysis of the vision discussions. From the analysis of the vision documents in Table 1, we can see that aspects of social thinking gain prominence in the future narratives of the three communities. Aspects of environmental thinking are present while interregional thinking aspects were only touched upon. It would be interesting to look further into this and investigate whether the fact that the community arena process is organized as a place-based process enhances the identification of the participants with the immediate surroundings rather than the global world that this place is embedded in.

Implementing and reflecting sustainability

We can trace the four dimensions of sustainability thinking not only in the visions, but also in the implementation projects that are initiated by the community arena groups. In both Wolfhagen and Carnisse, the implementation projects, being the opening of community centres, contain aspects of social thinking (communication, social cohesion, social learning etc.), environmental thinking (re-use of existing buildings, promotion of regional products, etc.) while interregional thinking and long-term thinking play a minor role. In Finkenstein, the working groups and the measures that are already implemented or are planned take into account all dimensions except the long-term: social thinking (integration, civic participation, bringing young and old people together, participation workshops, building social capital, a new culture of communication, integration, exchange, etc.), environmental thinking (public transport, bicycle lanes, land use, organic agriculture, renewable energy) as well as on interregional thinking (Finkenstein together with two other communities has recently become a "climate-energy-model region"; an exhibition around the issue of sustainable culture and quality of life is planned with two other regions). From the working groups in Finkenstein, one is prominently named "Sustainable Development" and covers energy, mobility and others topics. The long term thinking is only implicitly part of the projects as they should contribute to better living in the communities now and in the future.

In addition to the visions and the implementation projects, we can turn to the self-evaluation of visions and planned activities by the pilot project participants with regard to the four sustainability dimensions. The participants were asked a few questions with specific reference to sustainability during the evaluation interviews. In Carnisse, most of them indicated that sustainability was very important to them. To them, sustainability mainly refers to the environmental dimension or to aspects of energy saving as well as the long term aspect. For most of the interviewees the vision of Blossoming Carnisse is linking to sustainability, either in its role — hinting towards the future (the year 2030) — or through its topics e.g. housing, green surroundings and being in contact with nature. One of the six pathways of the local vision actually has sustainability in its name: "... green sustainable oasis". In Finkenstein, the participants reported a strong relationship between the vision and sustainable development. The objectives of the vision are focused on a high quality of life for all now and in the future. It is based on gratitude for and awareness of the already high quality of life in Finkenstein, due to good environmental conditions and the positioning of the village in the midst of mountains, with the lake Faak in the middle of the region. The participants are aware of the importance of protecting these local treasures to ensure the high quality of life for a common future. They see also a strong relationship between the whole project and sustainability: 9 out of 15 participants state that the project implements measures that are not just good for the moment but also the

far future and that they are not just good for Finkenstein but also for other parts of the world.

Closing remarks and intermediate conclusion

The focus in all processes, judging from the visions, the implementation projects and the discussions in the arenas, was on the dimension of social thinking. With the theme being quality of life for all now and in the future, the 'social thinking'-dimension was the entry point and led to aspects of the 'environmental thinking'-dimension that emerged at a later stage of the process. Operationalizing sustainability in four concepts was meaningful especially in putting social and environmental thinking on the table. It supported the action researchers in playing into local dynamics (e.g. issues of social cohesion) and linked these to the other three dimensions of sustainability without referring to the term at the outset.

There is an interesting contrast visible between the evaluation of vision and actions done by the researcher and the self-assessment of the participants done with regard to long-term thinking: while long-term thinking is explicitly mentioned as part of the visions to a very little extent, participants still strongly connect visions and activities to long-term thinking. In sum it becomes clear that sustainability played a major role in the community arena process and that there is a strong sustainability awareness and motivation of participants given which is transmitted into the developed visions and activities.

Discussion and outlook

Our approach in this analysis was to provide insight in the empirical results of the action research done and engage in a reflexive discussion with the theory. The aim of the arena process was to address societal challenges and raise awareness on sustainability related topics. The process aimed to strengthen social learning, empowerment and social capital which in their interplay are considered to be essential contributions to enhance the communities' potential of shaping sustainability locally and to deal with societal challenges. Next to having analysed the impacts of the community arenas regarding the core concepts of empowerment, social capital and social learning we reflected on the orientation of the pilot project processes towards contributing to sustainable development. We did this by analysing the representation of sustainability in the vision developed by the community arena and the activities already started by arena participants as well as a self-assessment of the participants on the importance of sustainability for the arena process and vision.

Our analysis suggests that the three pilot projects contributed to the enhancement of the communities potential to respond to societal challenges and shape sustainability locally: not only social, second order learning and empowerment but also the development of social capital as increased networks, trust and friendships amongst participants and beyond took place. Furthermore there was an orientation of the community arena process towards the aim of sustainability. The involved action researchers did not or did only initially and rather broadly introduce sustainable development as an aim or topic for the arena process, but focussed on related the discussion to it via four basic dimensions: Environmental, social, interregional and long-term thinking. Participants themselves developed the community arenas vision and activities and in the evaluation related them to the goal of sustainability, broadly captured in four dimensions as outlined above. It can as well be stated that the engaged citizens have already started to set up experiments and actions connected to the aim of sustainability. Taken together with a successful strengthening of social learning, empowerment and social capital, the arena processes are

very likely to have contributed to shaping sustainability locally and to raise the potential of the communities to solve societal challenges. The impacts of this success though have not fully understood as they will probably only become visible in the long run, and therewith are promising targets for future investigations.

Not fully clear is the impact of the arena process on strengthening the sustainability awareness as the analysis of the visions and (planned) activities does not focus on changes in sustainability awareness, motivations or values changes of participants. There has no before-and-after comparison been done. A critical assessment if the introduction of sustainability into the process via the four dimensions mentioned above was the most efficient way to secure the direction of the process towards sustainability therefore cannot be done in this case but most be left for future investigations. Furthermore not all dimension of sustainability as introduced by the action researcher can clearly be tracked in the developed visions and activities. While issues attributed to social thinking are very strong and to environmental thinking as well are very present, interregional and long-term thinking aspects are addressed only to a little extent. It would be worthwhile to investigate if this as well can be found in comparable processes or if it is a specificity of the InContext project, where social aspects had a strong relevance to local dynamics, e.g. in the deprived neighbourhood of Carnisse. This may reveal insights on good entry point for starting the learning journey towards making sustainability meaningful locally. An entry point for taking first steps which are needed in every journey, although it remains important to stay aware of the need to take the other steps, too.

In InContext participants themselves attribute the developed vision and activities strongly to long-term thinking, making it plausible that developed environmental and social activities are implicitly linked to the long-term. O'Riordan suggests that social issues are a worthwhile entry point for addressing sustainability in times of austerity and crisis: "Sustainability is now about creating a sense of trusting companionship between humans. Through this process, sustainability extends between compassionate humans treated fairly and with respect, and their natural world" (O'Riordan 2011: 161). Possible reasons for this are learning processes including value changes, e.g. making intrinsic values (e.g. caring, benevolence, compassion; e.g. Crompton 2010) more important. Changing values are one possible link between learning and empowerment process needs to a raising awareness and motivation on sustainability issues (cp. Rauschmayer et al. forthcoming, Schäpke & Rauschmayer 2012). Social learning in general encompasses this change, as it is not just about finding "new facts and a better understanding of relations and impacts but [...] a way to shape our values and reflect on assumptions and limitations behind our knowledge" (Garmendia & Stagl 2010: 1714). But: again not all kinds of learning including value and worldview change can be considered to be connected to sustainability awareness and motivation. Rauschmayer and Omann e.g. highlight the need for deep changes including strengthening the intrinsic sustainability motivation of actors (2012) in opposite to extrinsic motivations (Crompton 2010). Hedlund-de Witt (2013) very recently showed how only certain worldviews are positively related to sustainability motivation and behaviour. A further investigation of the impact of community arena processes on the values of participants appears promising as to further develop facilitation techniques that allow for second-order learning that works towards empowerment and raising sustainability awareness and motivation like. E.g. the link between building social capital, as trust, friendship and networks, and strengthening intrinsic values could form a valuable part of this investigation.

Finally, as the action research in the InContext pilot projects contribute to social learning, empowerment and social capital, only partly under an umbrella of sustainability as a broad aim of the process, it is of interest in how far the process lead to an increased

resilience of the communities at hand. And therewith to the resilience of society at large. Originating in ecology, the concept of resilience has developed to be referred to in many disciplines and ways. Core of all understandings is that resilience means the ability of a system to deal with disturbances, while the terms “ability” and “deal with” are filled with different ideas (see Brand and Jax, 2007 for an overview). As diverse as the understandings of the exact meaning of resilience are, a number of characteristics exist that contribute to the resilience of systems. These include for example strengthening response capacities, supporting self-organisation, (both relating to the core concept of empowerment and social capital) fostering learning, encouraging adaptation (related to social learning) and redundancy. Of course these characteristics are not set in stone and either judging a system’s resilience or taking action with a view to increasing its resilience need to be based on a sound and detailed analysis of the system and its specific characteristics. For InContext this clearly goes beyond what we can and want to provide at this stage but still we can assume that by touching on each of the above mentioned characteristics the pilot projects have increased social resilience. This way, and with a view to a greater perspective, the pilot projects help shaping a society that can deal with crisis and absorb external shocks and therewith increase society’s ability to respond to existing and probably even more importantly future societal challenges.

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End-user engagement for flexible energy consumption patterns

Towards tailored interventions for shifting and reducing household energy demand

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Abstract

The term smart grids refers to innovations in grid management and the physical infrastructure. In theory, future smart grids may support trends towards local decentralized energy generation, distribution and storage. As such they may support sustainable lifestyles and communities around decentralized patterns of consumption and production. However, future smart grids may also turn out to be of service mainly to a continued top-down management of demand and supply. The current deployment of smart meters at the household level is accompanied by a rising interest in how these meters can be used to introduce dynamic pricing to encourage end-users to shift or reduce their energy consumption. This paper reviews experiences with dynamic pricing. A dynamic pricing approach consists of three elements: the pricing mechanism (for instance Time of Use, whereby peak and off-peak prices are set according to time of day, day of week, and/or on a seasonal basis), supportive technology (e.g. smart meters) and feedback (e.g. on consumption behaviour or on prices). Taking a socio-technical approach, we inquire into the interactions between on the one hand new arrangements/interventions consisting of incentives, technologies and feedback, and on the other hand end-users who are part of a household and who differ in lifestyles. Mismatches between such arrangements and end-user expectations, lifestyles and needs can result in very different outcomes than expected by those who design and deploy these arrangements (utilities, Distribution System Operators (DSOs), policy makers). We show how household needs and wishes are usually not taken as a starting point for designing dynamic pricing interventions and discuss the consequences of that. After having addressed these issues of framing and shaping expectations – based on an elaborate review of dynamic and smart metering pilots and projects across Europe - we explore ways to design interventions such that household end-users and their lifestyle characteristics are central (rather than the technology or price incentive) so that the intervention is tailored (rather than 'one size fits all'). End-user segmentation can be helpful here but it also raises issues related to end-user data ownership protection. After all, metering data and segment-specific information represent a high value and the household increasingly is becoming a site of contestation where citizens are being asked for a passive engagement limited to providing personal and potentially sensitive data. We propose and explore the creation of an alternative 'socio-political' space: a decentralized solution that allows for a new form of engagement and role for both households and DSO's/utilities which may also contribute to a better articulation of different views and expectations around our future sustainable energy system, the smart grid and the roles of various actors and technologies.

1. Introduction: smart grids for decentralised energy systems?

1.1 Setting the scene: Smart Grids, what and what for?

The term smart grids refers to innovations in electricity grid management and the physical infrastructure. There is a lot of ongoing activity around smart grids, while at the same time no clear definition exists of what a smart grid is and what it should do, to what purpose. The term suggests that our current grid is not smart; one central characteristic of smart grid would be that it allows for more flexibility from both supply and demand sides to accomplish the most efficient generation and use of electricity. In addition it can also refer to a change in roles, whereby end-users (household, company and industrial levels) also can be producers in a more decentralized energy generation system. In theory, future smart grids may support trends towards more localized distributed energy generation, distribution and storage, including a future in which neighbours can buy and sell their electricity within their neighbourhood or as a cooperative and a situation in which people match their demand to the supply, e.g. mainly use some of their electric appliances when the sun is shining or the wind is blowing (Kobus, Mugge, & Schoormans, 2013). In the discussion on smart grids little attention is given to the need to change the incumbent organization and infrastructures of our current energy system to make this transition towards an increased distributed generation systems possible, particularly when it concerns the question of how this may ask for changes to the established stakeholder positions and the institutions that support the current organization.

Discussions have to a large extent focused mainly on how to best encourage household end-users to change their energy behaviours - more specifically to shift (and reduce) energy consumption. If end-users can be incentivised to decrease their energy consumption during peak hours, this may prevent the need to extend the grid and thus save considerable costs. In these discussions benefits like reduced costs, increased comfort, indoor climate, health impacts, and social aspects are identified. In addition, in this discussion the claim is often heard that if household end-users become more aware of their energy usage, through the feedback they receive from smart meters, this may encourage the uptake of a more pro-active role as energy users and producers. For society at large, reduction and shifting are framed as serving environmental goals (e.g. when it allows for more decentralised renewable energy generation) and as serving the societal goal of maintaining the stability of the energy system. As such smart grids *may* support the creation of sustainable lifestyles and communities around decentralized patterns of consumption and production. However, future smart grids may also turn out to be of service mainly to a continued top-down management of demand and supply – whereby it is uncertain how this will affect the options for local distributed systems.

A fierce debate on the future of smart grids and the lifestyle issues accompanying different forms of smart grids is as yet not taking place. Most of the talk and work on smart grids focuses on technology and accompanying services. In relation to societal end-users it addresses questions of how to achieve acceptance of technologies that already are designed and decided upon by policymakers. Much less attention is awarded to the institutional organisation of energy supply and demand (Wolsink, 2012) or on the lifestyle issues resulting from interacting with all these new technologies and services.

This lack of attention for the role of different stakeholders, not the least citizens and end-users, is perhaps most visible in the discussions on smart meters as a key technology for the deployment of smart grids. Smart meters, in contrast to the old ‘dumb’ meters make a

two-way communication possible between households and utilities or suppliers, depending on which party is responsible for the roll-out of the smart meter. In the Netherlands the distribution system operators (DSOs) are responsible for the roll-out. Smart meters are often regarded as a tool to accomplish energy savings through the encouragement of conservation behaviour at household level. The EU Directive 2012/27/EU calls for 20% energy saving in 2020 and stipulates a mandatory roll-out of 80% of the smart meters by 2020 in EU member states (Directive 2012/27/EU). This shows the high expectations policy makers hold concerning the role of technology (smart meters) in reducing household energy demand. Smart meters find their way, through standardised processes of replacement to an increasing number of households which has given rise to questions as to why we have smart meters when the rates are still dumb and do not encourage demand shifting (consuming electricity during off-peak times (Faruqi and Palmer, 2011)). Therefore the current deployment of smart meters at the household level is accompanied by a rising interest among Distribution Network Operators (DSOs), utilities and policy makers in how these meters can be used to introduce dynamic pricing to encourage end-users to shift their energy consumption. The mechanism of dynamic pricing is not new. Basically it refers to differentiated prices for the use of energy depending on time of day, day of the week and/or season of the year, or resulting from extraordinary circumstances (e.g. extremely cold weather; black-outs). The same mechanism is applied in e.g. the holiday-branch where off-season holidays are typically cheaper than during the peak-season.

DSOs and utilities claim that dynamic price incentives may provide households with insight in their own energy consumption patterns and related costs. It may help them in gaining or maintaining control over their energy consumption, saving costs, getting reassurance that behavioural changes have worked, getting support in motivating other household members to reduce energy consumption. Pricing incentives are always accompanied by at least basic technologies like smart meters, but can also become part of a whole new technological system such as a fully remotely controlled automated smart home. And there are many in-between possibilities. Whatever the configuration, these new technological systems interact with their users, and the households living in these smarter homes, and will require changes to their lifestyle, small or big.

1.2 Focus and conceptual approach

This paper focuses on dynamic pricing, because of the strong interest from the side of DSO's, utilities and governments in the question how dynamic pricing can encourage end-user to adopt new lifestyles and demonstrate behaviours and energy consumption patterns that are more in line with the needs of grid balancing. In other words they are interested in encouraging end-users to respond to price signals in such a way that end-users stop or start using electricity at a specific moments in time. Obviously, dynamic pricing will only be effective if households respond to these signals. This paper critically reviews the pilots and studies available on dynamic pricing and end-users. We will focus on the lifestyle changes that dynamic pricing interventions require from household end-users and if these changes match the real life needs and demands of these end-users. We will look for insights about how and why end-users would respond, alter (elements of) their lifestyle and under which conditions. Based on this review, we will then argue for the need to learn how end-users can become a more central concern and starting point for designing interventions aimed at changing energy consumption patterns.

While this paper is based on an extensive empirical inquiry, our approach is a socio-technical one that focuses on the notion of matches and mismatches between interventions and end-users. We build on social construction of technology (SCOT)

perspectives (Pinch and Bijker, 1984), and take a socio-technical perspective on innovation and deployment that views these as the outcome of processes in which technology and society interact and co-shape each other (e.g. Breukers et al, 2009; Jolivet and Heiskanen, 2010; Raven et al, 2009a, 2009b; Walker and Cass, 2010). As Pinch and Bijker's (1984) notion assumes a relevant social group that shares the meaning of an artefact, successful innovation, principally on how well it becomes embedded in a society via a process of negotiation that eventually arrives at some degree of closure and stabilisation (Kline and Pinch, 1999). From this perspective, engagement serves to encourage the active participation of societal actors in the design of interventions, in order to arrive at embedding. Such embedding not only requires end-users to adapt some of their expectations and wishes when interventions are presented to them. The actors that design and implement these interventions also need to have some flexibility to scrutinize their initial assumptions and expectations and allow for adaptations to the intervention (or how it is designed). Like with the diffusion of technological innovations (e.g. renewables) , interactions between implementer and other local stakeholders entails a confrontation between different preferences, interests and expectations: engagement operates *between* implementers and local end-users (Walker and Cass 2010).

Translated to the topic of dynamic pricing in this paper, we inquire how different elements of dynamic pricing interventions have matched with end-users needs and lifestyles. This paper is partly based on an extensive review of empirical evidence and conclusions from existing studies, cases, pilots, experiences (Breukers and Mourik 2013). In that review, we searched for a better understanding of why and how end-users change their behaviours in response to dynamic price interventions. After having introduced dynamic pricing interventions and two other essential components of a dynamic pricing approach (technology and feedback), we will discuss how behavioural change is implicated in dynamic pricing interventions. Next we will assess what we have learned from the review on why and how end-users have changed their behaviours and elaborate our argument on the need to pay more attention to these issues. As we will show, this can be done by performing segmentation of end-user behaviours and lifestyles. However, this also raises some additional issues that we will discuss in the final chapter.

2. Dynamic pricing interventions and how they match with end-user needs

2.1 Dynamic pricing incentive

Price incentives have the purpose to achieve a shift and/or a decrease in overall energy consumption. Time-dependent or dynamic pricing incentives vary according to time (e.g. hour of the day, season, critical peak periods). Dynamic pricing interventions were first introduced in in areas characterised by summer and winter peaks in demand combined with supply constraints. During critical hours, demand needed to be reduced and shifted to off-peak hours (e.g. California, Ontario, North-eastern parts of the USA and parts of Australia) (Darby 2006). For other countries, increasing problems in balancing demand and supply and expectations regarding the expansion of micro generation have triggered interest in dynamic pricing.

For DSOs and energy suppliers, dynamic pricing is a potentially effective means to achieve a better balancing between demand and supply and realising security of supply. In addition DSOs that have a clear public task (like the state-owned Dutch DSOs) are expected to further societal aims like increasing energy efficiency, energy conservation and facilitating the deployment of renewable energy, which also asks for strategic load

shifting to high supply hours. Several studies and reviews conclude dynamic pricing results in overall shifts and reductions in demand (Faruqui and Palmer, 2011; 2012; Stromback et al, 2011). Dynamic pricing can be coupled to automatic and remote control of appliances (e.g. washing machine, dishwasher, thermostat). A dynamic tariff can apply to price of energy set by suppliers and/or the price of transport of energy set by the DSO or TSO. We briefly present the most common forms of dynamic prices below.

2.1.1 Time of Use (ToU) pricing

Time of Use (ToU) tariffs recur daily and aim at encouraging people to use energy during periods of the day when overall energy consumption is lower. The focus is on shifting the demand from one period to another, not at reducing overall energy demand. Peak-price hours are invariable and known a long time in advance by the end-users. A day can have one or more peak periods during which the prices are higher compared to the rest of the day. Two to four levels of prices may be distinguished (peak, partial peak, off-peak, and weekend tariff) and in addition, prices may also vary according to the season (Stromback et al, 2011:83,84). Several trials conducted in Europe - Northern Ireland, UK, France, Germany and Norway - show realised peak reductions that vary from 0 to 12%.

2.1.2 Critical Peak Pricing (CPP)

Critical Peak Pricing (CPP) schemes offer lower year-round tariffs during non-peak hours in exchange for substantially higher tariffs during critical peak hours. Critical peak periods or event days occur at times of increased wholesale prices due to heightened consumption (e.g. very hot or cold days) or when the stability of the system is at risk (e.g. black-outs). The maximum number and length of critical peak periods is agreed upon with the end-user in advance. However, since the occurrence of critical peaks depend on market and weather conditions, the exact moments when these occur cannot be set in advance. Households are usually informed a day in advance of an expected critical day (Stromback et al, 2011:83) and the number of critical peak days varies from 1 to 18 a year (San Diego Gas & Electric Company 2010). An example in Europe of CPP is a pricing scheme introduced in France by EDF. This so-called TEMPO Tariffs pilot started as an experiment in 1989- 1996 but has been continued and scaled up since. The programme combines ToU with CPP and has been quite successful with an overall national peak reduction of 4%. ToU in combination with CPP can achieve a load shifting up to 30% (but this for a limited number of days and hours a year). In Sweden a percentage of 50% has been reached - thanks to electric heating and water heaters that provided significant flexible loads and thus good opportunities for shifting.

2.1.3 Critical Peak Rebate (CPR)

In Critical Peak Rebate (CPR) schemes the end-user is refunded at a predetermined tariff for any reduction in consumption relative to what the utility expected the household to consume during a few critical peak hours a year (e.g. very hot summer afternoons, or very cold winter evenings). Similar to CPP, with CPR the the maximum number and length of critical peak periods is usually agreed upon in advance while the exact timing cannot be predicted. End-users are usually notified a day in advance of a critical day (Stromback et al, 2011:83). Because with CPR participants benefit from participation, unlike with CPP where participants can be financially 'punished', this scheme may be more appealing to end-users. It is also a relatively new form of pricing which has not yet been used in a large number of pilots.

Both CPP and CPR have not seen wide roll-out in Europe, where the need for load shifting during a limited set of hours in a year is less felt than in countries with great climatic

differences and either extremely hot or cold days. An exception is the French TEMPO project. In addition CPP and CPR are particularly useful when there is a significant flexible load like for instance is the case with air conditioning and electric heating, which can be switched off during peak hours. In Europe these technologies are less widely used than in countries such as the US, Australia and New Zealand. Consequently, most experiences with CPP and CPR are from outside of Europe - with peak shifts of up to 38%. Effects have been shown to be lasting during long-term pilots (Stromback et al, 2011).

2.1.4 Real time pricing

With real-time pricing (RTP) the end-user pays a price that is tied to the electricity price on the wholesale market. End-users can be informed by a text message alert when wholesale prices reach a certain threshold so that they do not need to check the prices continuously (Stromback et al, 2011:83). RTP has been trialled on a limited scale (as day-ahead real time pricing which is technically less of a challenge), but the results are not very robust (Frontier Economics and Sustainability First, 2012; Stromback et al, 2011). To be truly effective RTP schemes need to be connected to smart appliances (price to device) that automatically respond. RTP is experienced as complex by end-users and to be really effective it may need to be connected to smart appliances (price to device).

2.1.5 Inclining Block Rate (IBR) pricing

As the name indicates, Inclining Block Rates offer block-wise increasing rates. This scheme is the least commonly applied. This pricing mechanism has been proposed as a complement to other dynamic pricing schemes and serves mainly conservation goals. As a household consumes more, the rates increase. The first block is the cheapest, sometimes even free, and subsequent blocks are increasingly expensive. Belgium has an IBR scheme since 2001, aimed at helping low-income consumers to keep their spending on energy within limits. However, it has had little effect on the consumption of the poorer households, mainly because they appeared not to be aware of the existence of this mechanism (CREG, 2010).

2.1.6 Shifting and reducing demand

Most dynamic pricing schemes focus on shifting the demand to off-peak periods, but some such as the inclining block rate also aim for overall reduction. A review of 5 large studies conducted mainly in the North-West of Europe concludes that: *"(...) in best cases a consumption reduction of 2-4% can be expected in the short term. This corresponds to around 15 to 30 Euros saved per year for an average European household (3,500 kWh at 0,20€ per kWh). The best cases include a smart meter that is linked to an IHD (direct feedback) or to accurate billing, with energy efficiency advice."* (Klopfert & Wallenborn 2010:21). US pilots show similar savings percentages (EPRI 2008). ToU schemes, while not aiming at reduction, may have the effect of making end-users more aware which may result in them reducing their energy consumption. With CPP and CPR, the overall reductions can be significant because the energy reduction during critical hours or days is unlikely to be fully compensated for with consumption at other times (e.g. if the air-conditioning or electric heating is turned off for a few hours). There is also a potential danger of increased consumption as a result of dynamic pricing: in the Italian Trento ToU project, the off-peak tariff was so low that even with increased overall consumption the energy bill of households still showed cost-savings, whilst their comfort level had increased. An increase of 13% resulted (Torriti 2012).

2.2 Essential components of a dynamic pricing intervention: technology and feedback

2.2.1 Technology

Next to the pricing mechanism (described above), a dynamic pricing intervention also includes two other essential elements: supportive technology and feedback. The first element, technology, covers a wide range of supportive and feedback devices, of which smart meters and In-House-Displays (IHD) are the 'must-haves' in combination with dynamic pricing. In House Displays (IHD) can provide feedback in a variety of forms and has been shown to significantly improve the response from end-users (Stromback et al, 2011). Other useful technologies include ambient displays like energy lamps (that change color when prices change), smart apps, websites, email services, but also very simple devices like paper mailings, more frequent detailed energy bills, fridge magnets or stickers (figure 1).

Figure 1: Example of a sticker indicating the time bands (CER 2011: 56)



The smart meter is needed for actual and real-time metering of the energy consumption patterns. Furthermore, it allows for the design of a tailored feedback that takes account of the particularities of the household. More complex technologies that support behavioural changes in response to pricing include all sorts of smart appliances that can be programmed to respond to (changes in) information and/or remote-controlled. In principle, the advantages of automation and remote control is that it allows for very quick responses and controllable levels of reduction, that it is available when system emergencies occur unplanned and when households are unable to take action (e.g. when away or asleep). Automation can include very low-cost options like for instance using a time-clock that makes sure that the fridge turns of 15 minutes at set intervals. However, it can also include high-cost options when smarter appliances have to be purchased and/or

made suitable for remote-control, and become part of full Home Energy Management systems, security systems, with couplings to personal computers (PCs), smart phones or pads. Crucial for effective use of automation is that the end-user understands and appreciates it. Several studies highlight concerns that consumers have to hand over control over their energy demand to third parties. In the Netherlands, 53 percent of the respondents object to handing over control over to utilities (Accenture, 2010 a, 2010b; Ryan & Blackmore, 2008).

Since supportive technologies are intended largely to interact with the end-users and need to be integrated in their homes, this interaction should fit the needs, wishes and capabilities of the end-users. Different (segments of) people are likely to appreciate technologies differently. Moreover, this appreciation may change over time – e.g. from an initial hesitant attitude to enthusiasm; or from enthusiasm to weariness with a particular technology (Van Dam et al, 2010).

2.2.2 Feedback

The second additional component to a dynamic pricing intervention is feedback. Feedback to support energy consumption reductions has gained a lot of attention in research recently (Darby, 2006; 2010; Mourik, 2011; Stromback et al 2011). A distinction can be made between direct, indirect and associative feedback (Darby, 2006). Direct feedback involves readily available information and learning from this feedback happens through the process of reading it or by having to pay for energy. The advantage of this form of feedback is that it directly shows the impact of behavioural changes. Indirect feedback is characterised by a time delay. Unintended feedback results from (associative) learning, e.g. when the bill increases after buying a new device or when the installation of own generation capacity encourages people to read their meter (more often). In addition to this distinction we also differentiate between feedback intended to communicate price changes and feedback intended to communicate (changes in) consumption patterns and volumes. Relevant lessons for designing tailored feedback as part of a dynamic pricing mechanism can be drawn from an earlier study (Mourik 2011) and are summarised in text-box 1.

Table 1. Lessons for effective feedback on consumption behaviour (Mourik 2011)

<ol style="list-style-type: none">1. Need for a smart meter and user interface (IHD, App, ambient technology)2. For changing routine behaviours : feedback should last at least 3 months3. Preferably, feedback is direct, without time-delay. This allows people to experience how turning devices on or off as well as other behavioural changes affect energy usage.4. The feedback is detailed, providing information about devices, spaces, people and functions (e.g. cooking, heating, entertainment).5. The feedback is historical, normative and involves goal setting.6. The feedback is positive, graphical and symbolic.7. There is a combination of user-interfaces (device media/locations) at different spots in a household displaying different information in combination with particular media.8. The feedback system is being continuously improved and updated9. There is maximum interaction possible with the meter and/or display which results in new routines around the feedback system.10. A supportive social environment ensures that there is no constant negotiation on underlying norms

11. The feedback also gives personal advice and is coupled to other interventions
12. There is no negative impact on (perceived) comfort and ease-of-use.

2.2.3 Pricing, feedback and technologies

Different pricing incentives will ask for different types of feedback (feedback related to price changes and feedback related to consumption changes). RTP needs real time feedback on consumption and on price changes. This can be provided by means of ambient technologies such as light bulbs change colour when prices increase and/or consumption is 'too' high. Historical feedback enables users to assess the impact of their changed behaviour on consumption and price. For ToU, feedback should at least show the attained reduction or shift in response to the peak and off-peak tariffs. Some people may want to check this on a daily basis, for others find a monthly (paper) overview sufficient. In addition simple technologies such as stickers or magnets with an overview of the ToU periods are very valuable to remind people. For ToU the feedback will need to be provided long enough for new routines to rise. When new routines have become embedded, the frequency of feedback can be decreased. Providing feedback whenever consumption is increasing again during peak hours, can be useful as well. Feedback that informs the individual members of a household of their achievements can be useful too, at it enables them to take informed decisions about the best options for reduction and/or shifting.

The more stable the price incentive over time, the simpler the feedback can be. When pricing incentives are not frequent, and even not fixed in advance (e.g. CPP, CPR), text message alerts, or other reminders and prompts via email or facebook will work well. The more frequent the feedback on consumption is needed, the more complex the necessary technology will be: e.g. smart appliances, real-time feedback, remote control, energy orbs etc.

2.3 Effective combinations: is more better or less more?

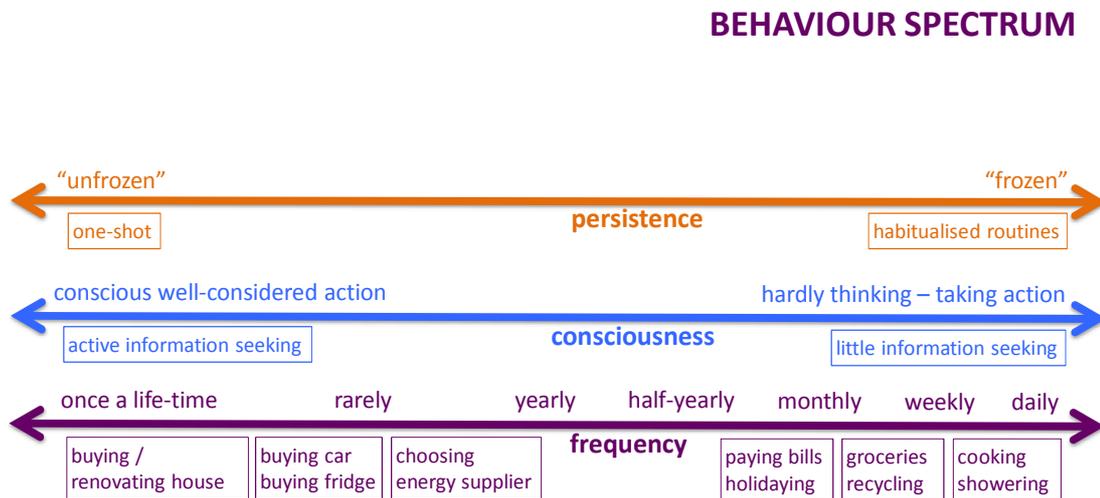
Some studies argue that the more elements are used, the the higher the response of people (in terms of the achieved shift and the number of people that respond). Faruqui et al (2010) demonstrated after analysis of multiple large pricing pilots in the US that the combination of ToU, CPP, CPR, with multiple enabling technologies and feedback technologies generated the highest peak clipping and load shifting. Obviously, with such a 'full court' approach - using as many technologies and feedback options as available in order to reach as many different people as possible - a large section of different segments can be reached. However, this will not deliver the most cost-efficient approach and since the brunt of the costs eventually comes down on society, it is undesirable from a societal perspective. To illustrate that less can also be more: in a New Zealand's pilot that targeted a particular segment (high incomes, high age, new houses) ToU worked well in combination with only energy saving tips and a monthly bill that showed the realised shifts during peak-periods per day (Thornes et al. 2012).

3. Dynamic pricing interventions that match end-user needs, behaviours, capacities and household related options

3.1 Behavioural change and dynamic pricing

To assess how pricing mechanisms so far are successful in targeting end-users we first need to understand what behavioural changes are asked from end-users. Therefore we first briefly what the types of behavioural changes are that ToU, CPP, CPR or RTP ask for. We can distinguish between conscious/intentional behaviours and routine behaviours, but it would make more sense consider a behaviour spectrum as displayed in figure 2 below.

Figure 2: Behavioural Spectrum¹



Intentional behaviours can include one-shot behaviours that occur rarely and consciously, like for instance buying a house, or investing in the house (e.g. insulation, double-glazed windows). Examples of more frequent intentional behaviours are e.g. the purchase of smart appliances or changing the settings of the thermostat. Dynamic pricing in the form of CPP, CPR and RTP encourage intentional behaviours - e.g. the critical peaks only occur a limited number of days a year in which energy consumption needs to be reduced or shifted. With RTP however, if the response is automated (e.g. automated response when the prices reach a certain threshold, the intentional behaviour only pertains to the moment of deciding to automate the response). Routine behaviours are recurring, habitual behaviours that affect how we go about our daily doings (cooking, washing, caring,

¹ The authors thank Julia Backhaus for contributing to this figure

working, etc). Unconscious routines can be changed by making them conscious first, after which an intentional behavioural change is possible. Next, time is needed for this changed behaviour to become a new habit/routine. Examples include a change in dishwashing times to other set times of the day or evening; or changing routines in showering – in length, frequency or the amounts of hot water used. ToU typically asks for changes in routine behaviours: end-users are encouraged to permanently perform (different) behavioural patterns at different times of the day/night. People need at least 3 months to get used to new (dishwasher, washing machine, cleaning, entertainment, eating) routines. It is during this period, but preferably also after, that reminders and prompts are crucial (Abrahamse et al, 2007; Darby, 2006; Fischer & Duscha, 2008; Janssen et al, 2007; Martiskainen, 2007). The effectiveness of ToU increases over time: people unfreeze their old ways of doing, adopt new ones and these become established routines in course of time. They may even purchase supportive appliances to help them control the energy usage of certain household appliances, like for instance timers (Filippini 2011; Thornes et al 2011; Torriti 2012).

Generally speaking, investment and intentional behaviours are easier to perform compared to changing routines (Breukers et al., 2009; Mourik et al., 2009; PwC2009). When changing routines, people find turning off the lights easier than using dishwasher and washing machine more efficiently. Turning appliances off is an even more difficult routine to adopt. Decreasing temperatures or decreasing level of coolness (in summer) is done less easily as this is perceived as directly impacting on the need for comfort. And turning off the stand-by mode is done even less frequently as it affects the perceived need for convenience and control (people often worry that that programmed settings are lost when turning the appliance really off) (DEFRA, 2007). Hence, there appears to be a negative relation between changing routine energy behaviour and the need for comfort and convenience. This also has consequences for the effectiveness of price incentives that target demand shifting through routine behavioural changes. Table 2 summarises the theoretical potential for load shifting and the reduction for different types of loads (appliances and practices) of households.

Table 2: options for load shifting and reduction for different types of household demand (Breukers and Mourik 2013)

Appliance	"Household Practice or need"	Flexibility in terms of potential load shifting	Options for reduction	Flexibility in terms of Willingness to shift and reduce	Automation/ remote control?
tumble dryer	Washing & cleaning	+	+	-	=/-
washing machine	Washing & cleaning	+	+	+/-	++
dish-washer	Washing & cleaning	+	-	+	+/-
cooking (if electric)	Eating & drinking	+/-	-	-	-
water cooker,	Eating & drinking	+	-	-	-

Appliance	"Household Practice or need"	Flexibility in terms of potential load shifting	Options for reduction	Flexibility in terms of Willingness to shift and reduce	Automation/ remote control?
microwave, espresso machine, coffee grinder, blender, oven					
fridge and freezer	Eating & drinking	+	++	++	++
lights inside the house	Comfort	-	++	-	++
outside lighting	Safety	+	-	+	++
TV's	Leisure	+	-	-	-
music installations	Leisure	+/-	-		-
games	Leisure	+/-	-	-	-
PC's, tablets,	Leisure/ administration	+/-	-	-	-
hair-dryer; el toothbrushes, el razors, etc.	Care	+/-	-		-
stand-by	Ease	+	-		+
Vacuum cleaner; do-it-yourself and garden-related machines (e.g. lawn-mower, drilling machine, terrace heater)	Cleaning and maintenance of the house, balcony and/or garden. Hobby	+	-	+	-

When designing a dynamic pricing approach, it is important to understand what motivates behavioural changes (both intentional and routine behaviours) and consequently the responsiveness of households to pricing signals and the potential flexibility of certain loads in a household and how such changes can be made durable.

3.2 Shortcomings in dynamic pricing pilots, trials and reviews

An extensive review (Breukers and Mourik 2013) revealed that mismatches between interventions and end-user lifestyles, behaviours and needs can result in very different outcomes than expected by those who design and deploy these arrangements (utilities, DSOs, policy makers). Further, the suggestions of what dynamic pricing can accomplish, based on a host of trials, pilots and reviews, is overly optimistic due to a number of reasons (Klopfert and Wallenborn 2011) like the tendency to extensively report on successes rather than on failures; self-selection of (motivated) participants that result in distortions; the drawback effects (when the newness of an intervention is worn off, responsiveness diminishes); the Hawthorne effect (people behaving differently when they know they are being observed – however this effect weakens as the duration of a pilot increases).

Most pilots and trials on dynamic pricing have a strong techno-economic bias. Most studies appear to ignore the fact that end-users can have various motivations for changing their behaviour - a financial motivation being one of these. Most studies conclude with recommendations towards designing a “one size fits all” dynamic price approach. There are several reasons why that is not advisable when aiming at energy consumption reduction or shifting. Such approaches usually focus on providing financial incentives, assuming that people are economically motivated to participate. However, plenty of evidence shows that people can also have different motivations that relate to environmental goals, health, comfort, the wish to ‘do good’ etc. Two dynamic pricing pilots in Sweden (Lindskoug, 2006) showed that a majority of participants were motivated by other than economic considerations. Research on energy DSM aimed at energy consumption reduction has shown that approaches that predominantly focus on individual behaviours without addressing the social and physical environment in which behaviours are embedded have not been successful in achieving *lasting* behavioural changes (Breukers et al, 2009). In the case of dynamic pricing, attention for the characteristics of the house, the appliances, as well as attention for household dynamics are relevant to take account of (Hargreaves et al 2010). Furthermore, if end-users are targeted with financial incentives only, this increases the risk of rebound. Because no social norms are addressed, no pro-social behaviour is likely to occur. Money saved is likely to be invested in other energy-consuming activities - because there was no motivation based on pro-social values, nor any broader consideration of societal interest related to energy- and environmental issues was involved.

3.3 The end-user as the point of departure

A shortcoming of many pilots and studies is that they focus on whether price incentives have had an impact in terms of saving or shifting, while leaving the question *how* and *why* end-users change their energy behaviours unaddressed. End-user needs and wishes are rarely taken as a starting point for designing dynamic pricing interventions (Breukers and Mourik 2013). This raises the question as to how this can be changed. Rather than starting an intervention with selecting instruments (price incentive, technology, and feedback), we propose to turn the process around and take the end-users as a starting point in the process of designing a dynamic pricing approach. When we know more about the end-users, their needs, motivations and behaviours, we are better able to design a dynamic pricing approach that also fits their interests and needs (Breukers et al, 2009).

3.3.1 Socio-demographic segmentation is not enough

Segmentation is not entirely new to dynamic pricing pilots. Segments are typically constructed around particular ‘load profiles’ in order to match the envisaged pricing

approach and technologies with the appliances and technologies in the household. While useful, it does not help in assessing whether the people targeted will perform the behavioural changes needed to realize these potentials in full. Ex-post segmentation on socio-demographic factors has also been used to correlate end-user responses to their socio-demographic characteristics. In an Irish trial, the level of energy consumption reduction was found to decline along with socio-economic class - also due to the overall higher levels of household consumption in high-income households compared to low-income ones. For peak reduction these relations could not be established with equal clarity. Factors such as employment status and home ownership also impacted overall and peak reductions (CER 2011:83). Another ex-post study using a large database (50,000 households, socio-economic information, building-specific information and meter readings on heat and electricity consumption) revealed the following correlations between users, buildings and energy consumption (Gram-Hanssen, 2011):

- The number of people that a household consists of is the strongest predictor of electricity consumption; income comes as a second and size of the home as a third most important predictor.
- Age and education of the residents explain consumption only to a small degree
- Living together with more people is more energy efficient (the trend towards more single-person households increases energy consumption).
- When comparing households in detached houses of the same size and with the same income, huge variations appear in the electricity consumption appear. *So while household size and income are the strongest predictors for electricity consumption, they still only account for one third of differences in consumption.*

Furthermore, heat consumption is much more dependent on the building's energy efficiency, while electricity consumption is more dependent on end-user practices (including number, size and use of appliances) (Gram-Hanssen, 2011). A recent study among more than 4,000 US households found that lifestyle factors reflecting social and behavioural patterns associated with air conditioning, laundry usage, personal computer usage, climate zone of residence and TV use explained 40% of the variation in electricity consumption (Sanquist et al, 2012).² And a Swedish study found large differences in electricity consumption between households with very similar profiles in terms of electric heating systems, number of household members, and perceptions and experiences with ToU mechanism (Bartusch et al, 2012). Another study (>1000 respondents) found that the use and duration of appliances related to cleaning and entertainment accounted for a large part of the variance in electricity consumption between otherwise similar households (income, age, dwelling) (Bedir et al, 2013). What we can conclude from the above is that differences in end-user practices and in the energy consumption of households can only to a limited degree be explained by the socio-demographic factors that the usual segmentation studies use. These include factors such as age, education, income, environmental attitude, household size etc. While such segmentations can help to

² Sanquist et al define lifestyle as : "...patterns of consumption influenced by decisions at various points across the lifespan, such as what profession to engage in, where to live, when (or whether) to marry and have children, and more proximal choices regarding what to purchase and how and when to operate energy consuming equipment. This conceptualization suggests that analysis of life-style and energy consumption needs to encompass not only the traditional demographic segmentation elements, but also information about what people own and how they use it" (2012:1).

find out how to tailor a *communication* strategy to different segments (e.g. the sort of information, level of detail, media used to communicate) these segmentations do not predict actual behaviour.

3.3.2 Comprehensive segmentation

Understanding what motivates lifestyle behavioural changes (both intentional and routine behaviours) and consequently the responsiveness of households to pricing signals, the potential flexibility of certain loads in households, and how such changes can be made durable is important when designing an effective dynamic pricing approach. Different end-users are likely to have different attitudes, motivations, behaviours, capabilities, knowledge and other resources - which will affect how they respond to and participate in dynamic pricing interventions. Ideally, these different end-users should be targeted in ways that fit their needs, preferences, knowledge, capabilities etc.

This would entail that real needs and real behaviours of real households are included in a segmentation, to understand how their attitudes, motivations, awareness, capabilities, sociodemographic variables, home and appliances play a role in maintain a certain way of life. To understand how a particular lifestyle brings with it certain patterns and volumes of energy consumption it is important to know how people wash, eat, clean, care, relax, move, sleep etcetera. Segmentation offers a first step towards tailoring a pricing approach to the motivations, behaviours and needs of a group of end-users that share relevant characteristics - thereby increasing the chances that these end-users will respond. Such a comprehensive segmentation includes several crucial elements:

- Attitude, motivation, awareness, capabilities, behaviours
- Sociodemographic variables
- House-related characteristics
- Appliances
- Presence patterns
- Household dynamics: timing and negotiable (read flexible) use

Segmentations that address all these elements do not exist to our knowledge. Nevertheless, first steps to segment lifestyles have been undertaken (Sütterlin et al, 2011). Segments resulting from such a segmentation on lifestyle could then be matched to tailored interventions that consist of a combination of e.g. pricing mechanism, technology and feedback. To explore this further, an effort has been done to elaborate dynamic pricing mechanisms based on end-user lifestyle segments for the segments identified in the Swiss study by Sütterlin et al (2011). The resulting segments, offer end-user profiles that we can reasonably expect to occur in the Netherlands, be it in different percentages and possibly with nuance differences. Table 3 shows the segments. For each segment, several relevant questions are posed (table 4) regarding motivations (e.g. financial, environmental, social), behaviour and opportunities for change (and should this be on reduction and/or shifting) and expected willingness. Based on the answers, argued choices for dynamic price signal, technologies and feedback can be made. This is illustrated for segment 1 in table 4 and figures 3 and 4 (to be read horizontally).³ Based on

³ Each element in the toolbox is a building block that can be chosen or not. Each column represents the building blocks that can be chosen within the categories: pricing mechanism, technology and feedback. The combination of selected building blocks create a basic design for a tailored dynamic pricing intervention aimed at a specific segment. For an elaboration of all six segments, we refer to Breukers and Mourik 2013 (or contact the authors)

this, further tailoring could be done based on the house characteristics, appliances, presence-patterns and particular other local characteristics..

Table 3: Six segments derived from Sütterlin et al

<p>Segment 1: Idealistic savers (15.6%)</p> <p>This group shows most efforts to save energy, both through routine behaviour and efficiency measures. Driven by idealism, these people are willing to make financial sacrifices and impose restrictions to themselves even if it means loss of comfort. They support policies that put a price on the energy intensity of products within a product category. They believe that they can make a difference, in a positive sense.</p>
<p>Segment 2: Selfless inconsistent energy savers (26.4%)</p> <p>This group also shows significant energy-saving activities. At the same time, they are not very consistent: although they do believe that they can make a difference, they are quite inconsistent in terms of energy efficiency measures at home - because at that level they do very little.</p>
<p>Segment 3: Thrifty energy savers (14%)</p> <p>The thrifty savers are into energy-saving as long as this does not bring them any negative financial consequences. This also applies to their acceptance of policies: these should not ask for any additional financial efforts from end-users. Their motivation is not primarily intrinsic- but relates to financial necessity and social pressure.</p>
<p>Segment 4: Materialistic energy consumers (25.1%)</p> <p>The materialists do little to save energy, but are open to energy efficiency measures for the house. They are not very positive about policies if these have financial implications for them. The main motivation for energy saving behaviour is financial.</p>
<p>Segment 5: Comfort-oriented indifferent energy consumers (5.3%)</p> <p>The comfort oriented are the least likely to energy saving behaviour. They do not care about the potential societal problems that the increasing energy consumption entails. They do not feel responsible and energy consciousness is nil. Their behaviour is driven by the search for personal comfort. This group of people is opposed to restrictive policies and interventions that discourage this behaviour.</p>
<p>Segment 6: Problem conscious welfare-oriented energy consumers (13.6%)</p> <p>This segment is not enthusiastic about saving energy. Although they are aware of the consequences of their behaviour and also believe that energy-saving behaviour can make a difference, do not they feel called to action. This is possibly because they think that their ability to save energy is very limited. Although oriented towards comfort, they also feel a certain social pressure to do something about the energy situation.</p>

Table 4: Considerations underlying the choices of building blocks for segment 1

Segment 1	Idealistic savers
General Considerations	This group shows most efforts to save energy, and already does a lot in terms of reduction. Driven by idealism, these people are willing to make financial sacrifices and impose restrictions on themselves even if it means loss of comfort. This customer is knowledgeable and consists largely of highly educated women.
Preferred behaviour	Both routine behaviour and efficiency measures
Main motivation	This group could be motivated to shift their consumption but from an environmental motivation.
Choices related to Pricing Mechanism	Saving and shifting will not be financially motivated (no emphasis should be put on money) and a price incentive may not be the best incentive. If a price incentive is used, a combination of ToU, possibly with CPP, is a good option to visualise energy shifting options. Because this segment is not financially motivated, RTP is probably not suitable (because you still need to respond strongly to price). You could also simply CPP (and focus on shifting only).
Choices related to technology	Since this group is highly educated and well informed, different technologies can be used to support further behavioral change. The use of technology should be functional for this group. Almost all options are ticked in the toolbox because these people want information to be provided both at home and at work on PC, smart phone, IHD. This group does not like ceding control (especially to a party that is less environmentally conscious and idealistic than themselves). Remote control by third parties is not an option, automation is possible if this group can control it themselves.
Choices related to Feedback	Detailed and differentiated information is desired. Because this group is well informed, she is well able to interpret the information. Text, graphics, and / or lamp signals when price changes are options. Tailored advice needs to be focused on shift options. What is important for this target group: who gives feedback and how reliable they find this party?

Figure 3: toolbox to design tailored interventions

Toolbox				
PRICING Mechanism	TECHNOLOGY	FEEDBACK: Price related	FEEDBACK: Use related	FEEDBACK: Frequency, Level, type
none	Smart meter	€/kWh	Use kWh	Per appliance
	IHD		Reduction kWh	Per space
IBR	Energylamp	Colour change	Use €	Per activity
	Website		Reduction €	Historic
ToU	Email	Sound	CO2 emission	Comparative
	App	Emoticons	CO2 reduction	Goal setting
CPP	Post		Emoticons	Benchmark
	Magnetic sticker	Graphic	Graphic	Invoice detail.
CPR	Automation		Numbers	Tailored tips
RTP	Remote control	Tailored tips		

Figure 4: Dynamic pricing approach for segment 1 (the blue blocks)

Pricing Approach segment 1				
PRICING Mechanism	TECHNOLOGY	FEEDBACK: Price related	FEEDBACK: Use related	FEEDBACK: Frequency, Level, type
none	Smart meter	€/kWh	Use kWh	Per appliance
IBR	IHD	Colour change	Reduction kWh	Per space
ToU	Energylamp	Sound	Use €	Per activity
CPP	Website	Emoticons	Reduction €	Historic
CPR	Email	Graphic	CO2 emission	Comparative
RTP	App	Tailored tips	CO2 reduction	Goal setting
	Post		Emoticons	Benchmark
	Magnetic sticker		Graphic	Invoice detail.
	Automation		Numbers	Tailored tips
	Remote control			

4. Discussion: end-users tailoring interventions (to) themselves

4.1 Tailoring without giving away private and sensitive information...

In the preceding section we elaborated a first exploration of how a tailored pricing intervention (combining price incentive, technology and feedback) that takes the end-user as a starting point could be designed. This practicability and desirability of such an approach can however be questioned. A tailored intervention requires a lot of detailed personal data from individual households and a comprehensive segmentation asks for a lot of private and sensitive information from households. It is unlikely that end-users provide such information easily - for several reasons, one being the perception that the privacy and security of their data cannot be safeguarded. A tailored solution thus raises additional issues to the discussions about ownership and protection of smart metering data – namely ownership and protection of segment-specific information. After all, metering data and segment-specific information both represent a high value and the household increasingly is becoming a site of contestation where citizens are being asked for a passive engagement limited to providing personal and potentially sensitive data. Rather than trying to create an elaborate and costly centralised data system (Curtius et al. 2012) that ‘guarantees’ the safety and protection of privacy and other end-user interests, it may be a better idea to keep end-user data and information decentralised.

4.2 Decentralised Do-It-Yourself Segmentation

We propose that a further exploration is needed for the creation of an alternative 'socio-political' space: a decentralized solution that allows for a new form of engagement and role for both households and DSOs/utilities which may also contribute to a better articulation of different views and expectations around our future sustainable energy system, the smart grid and the roles of various actors and technologies. That would also better fit with a future situation in which end-users have the opportunity to become more actively engaged in smart grid technologies and distributed generation. It would make it easier for Dutch DSOs not to compromise their task of furthering of the public interest when working closely with parties that have very different priorities (e.g. huge interests in selling as much smart and intelligent devices as possible collide with cost-efficiency for end-users as a priority). In a decentralised data and information management system, the end-users' active role would become key. Such a system ensures that personal information needed for the segmentation as well as household metering data remain with the end-user and with no one else. This also resonates with other studies that discuss the options of full end-user control and ownership over (metering) data.

The role of the DSO could be to design a tool that provides to the end-users several segment-descriptions with accompanying price-technology-feedback combinations with an explanation of critical issues and potential risks and benefits. Or the toolbox could allow for a household to fill in their personal data and the tool would subsequently advise the best fit in terms of combination of pricing mechanism, technology and feedback. This would allow households to choose the segment that fits their situation best. Next, the households could ask the DSO or retailer for this particular dynamic pricing intervention combination (perhaps with options to adapt elements further to be in line with one's personal situation). The toolbox would serve to enable interaction between households and DSO and/or retailer, in such a manner that personal data and information stay with the end-user. The end-user keeps control over his/her data, the choice of segment and the choice for a price intervention. While the authors are interested in further investigating the feasibility of such a toolbox, this paper also served the aim of opening up the discussion on the role of end-users in our future grid management, in terms of being actively engaged and possibly co-owners.

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Discussion Report

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Moderator: Julia Wittmayer, DRIFT, Erasmus University

Bottom-up approaches vs. top-down management

The discussion opens with a reflection on what are often perceived to be two opposites: bottom-up, participatory approaches and top-down management to support more sustainable lifestyles. Robert Rattle appreciates user-centred approaches, which were discussed in all three papers, and their attempt to take people's needs into account. At the same time, he wonders whether bottom-up approaches do indeed support more sustainable lifestyles or whether top-down management, which is nowadays mostly done for economic reasons, may not be more effective. Siliva Breukers responds that, if financial considerations are (considered to be) the main driver for sustainability, top-down management may indeed be the most efficient and effective approach. However, thinking broader and taking sustainability to include notions of democracy and participation, care for the environment and other people, other motivations to become engaged in change processes come to the fore. After all, in any sustainability project or intervention, there is usually more at stake than sustainability in a narrow sense (e.g. resource consumption reduction) and it is worth reflecting on and including these other aspects or dimensions of sustainability. Interventions that aim at sustainability can often increase their outreach or impact by addressing other, e.g. social, needs more openly or clearly. Alternatively, one could consider turning participation and engagement into a game that may change over time in terms of its goals, approach, and needs and values it relates to.

Gamification as a means to stimulate more sustainable lifestyles

Tying into the idea of creating sustainability games, Flor Avelino raises the question whether gamification, in general, may be a way to draw more attention to ecological issues and to challenge people to consume more sustainably. We had heard during a session on the previous day that the computer game *Grand Theft Auto V* had, globally, sold millions of copies shortly after its release. This could be taken as an indication for how much potential there is to engage people through gamification.

Silvia Breukers cautions that although providing consumption feedback is often useful and has behavioural effects, we might not want to solve all issues technically and view gaming or smart feedback as a silver bullet. Felix Rauschmayer adds that practice theory tells us that electricity itself is not considered but that people simply do what they need to do, e.g. wash their clothes or travel to work, and that electricity and resource consumption is embedded in these practices. One question, therefore, would be whether behavioural change should be stimulated by helping people to use a particular technology, i.e. the

washing machine or the car, more sustainably and to save money and, thereby, emphasise individualistic and economic values; or whether the focus should rather be on strengthening altruistic and ecologic values. Marlyne Sahakian reflects on possibilities to allow for different choices and perspectives relating to a variety of values that could be catered to by gamification and still allow for autonomy. To this, Flor Avelino responds what indeed other values than monetary ones could be triggered or stressed. For instance, the focus of gamification could rather be on empowering people and facilitating collective engagement rather than competition of individuals. Silvia Breukers adds that such games would not need to have sustainability as primary goal or could change over time in terms of what and whom they target and which values they address.

R. Rattle notes that conferences dealing with the gamification of sustainability exist but that the notion of values and whether a change in values is needed, and if so, how to bring such change about, is absent from discussions there. He appreciates how the paper by Schöpke et al. tries to evaluate whether values have changed and whether or not this triggers more sustainable behaviour. It is relevant to keep in mind that a change in value can go either way and can also relate to a change in behaviour either way: towards or away from sustainability. Notably, there is no either-or but, even for the individual person, there may be change in both directions.

Values, value creation and value change

Triggered by the repeated mentioning of values, Julia Wittmayer, the moderator, asks Yuliya Voytenko, how she, in her work on innovative value creation models, considered and defined values. Yuliya. Voytenko elaborates that they considered financial, environmental and social values and that is worth believing in individual values as drivers of change. Felix Rauschmayer connects this back to the notion of the niche-regime which was discussed on the previous day by Flor Avelino et al. in their paper on energy cooperatives. Interestingly, such kinds of cooperatives in Germany occasionally take over the ownership of the grid for reasons of self-empowerment and to exclude dominant players. Since it is often difficult for the individual to bring about change, the group has more influence. Hence, these meso-level activities are interesting to study and support.

Niko Schöpke wonders how the different types of values mentioned (social, environmental and financial) relate to one other and across different scale levels (individual, community, etc.). Udo Pesch mentions that ethics makes a distinction between moral and financial values and Max Reichenbach adds that financial values are seen as instrumental for need fulfilment. Looking at the matter from a business point of view, Yuliya Voytenko mentions that companies usually solely drive for financial value creation and employees are, in a way, required to share this value as their primary concern. The innovative value-creation models she and her co-author investigated, relate to a number of different values and also employees are motivated by different values.

Udo Pesch addresses the InContext team with the question whether they could make out directionality in the value change they observed in their project. Niko Schöpke replies that their analysis of different dimensions of change processes showed how biospheric values entered the scene. In the Rotterdam project, participants certainly learned about their power vis-à-vis local government which may have created a more equal level playing field, Julia Wittmayer adds.

Drivers and barriers to sustainable lifestyles

J. Wittmayer reminds the group that the session is entitled “drivers and barriers for pathways and transitions” and invites reflections. In a group brainstorm, “connecting people”, “involvement”, “participation”, “empowerment” and “a broad understanding of sustainability, including social needs” are mentioned as drivers. The group reflects on empowerment which is regarded to be an integral part of sustainable development by most, but as having potential negative aspects. For example, empowerment requires citizens to engage and not everyone might be willing or able to do so. In addition, every empowerment may bring disempowerment too, because it stigmatises those who lack power and need to be empowered. Therefore, the notion of empowerment calls for reflexive questioning, e.g. empowered to what, by whom and how.

Regarding the drivers mentioned, N. Schöpke emphasises that a focus on social learning and the community alone do not necessarily contribute to more sustainable lifestyles and M. Reichenbach adds that transition processes with an open agenda may inherently bear a number of barriers to sustainable development. For example, different actors’ goals or agendas may conflict or ecological issues might be left aside.

The group agrees that when thinking about drivers and barriers for sustainable lifestyles, it is worth distinguishing whether one would like to support people in taking small steps towards more sustainable ways of living, or whether one would like to address the lock-in of current practices in existing systems. It may be worth helping people to reflect on why our current lifestyles are the way they are and to what extent this comes down to individual or community choice.

4b

Potential of Individual Change and Alternative Consumption Niches

What can we learn from demonstration projects?

Towards more sustainable consumption practices

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Introduction

This position paper builds on an article in press that looks at both social practice and social learning theories (Sahakian and Wilhite, in press). In that paper and through different empirical examples, demonstration projects – among other factors – are seen as being significant towards changing certain consumption practices. The idea behind this position paper is to further discuss and debate the potential value of demonstration projects in promoting more ‘sustainable’ pathways.

In the past, demonstration projects have proven successful in shifting certain everyday practices: washing machines and other household appliances were showcased door-to-door to housewives in the post-War era in certain contexts, promoting convenience along with family values and new ways of doing. Demonstration projects are also valued in marketing and promotional strategies: it has been statistically proven that test-driving a car enhances the likelihood that that particular car will be bought, for example. The main question of this position paper is, can demonstration projects also serve towards introducing more ‘sustainable’ consumption practices?

The main hypothesis of this paper is that the way we learn may have to do with being engaged in new types of practices (Lave and Wenger, 1991 / 2009) but that the different dimensions of a practice have to come together – including interactions with a product, the opinion of trusted people, norms and values, among many other elements. Through the social practice theory lens, consumption is being conceptualized here as being made up of things, people and culturally-grounded social structures, where changes in practices can involve situated learning in communities of practice. Demonstration projects can therefore involve interacting with new products and services, which represent one form of learning, but participating in other types of learning communities – such as online social networks, associations or membership groups – could be another. The assumption here is that raising awareness solely through information campaigns on one hand, or by introducing a new technology or product on the other may not suffice.

The paper provides a brief introduction to the conceptual framework, followed by a summary of different examples related to food, beverage and energy consumption. The examples are pulled from the article referenced above, as well as derived from in-depth interviews and observations, which took place between 2011 and 2013 in Geneva, Switzerland and Metro Manila, the Philippines. The opportunities presented by demonstration projects will be discussed, as well as the issues that such projects raise.

Conceptual framework

This section provides a brief introduction to a conceptual framework that is further elaborated in Sahakian and Wilhite, in press, for the purpose of moving quickly into the examples and discussion.

How are we conceptualizing consumption?

We accomplish many tasks on a daily basis, without much reflection, such as shopping for food, bathing and cleaning, and getting around. We can therefore say that many of our everyday practices are habitually reproduced, and that certain habits are energy and material intensive. One goal for those involved in 'sustainable consumption' research and action would be to change these habits towards more 'sustainable' pathways.

The stubbornness of habits could depend on how deeply anchored the habits are in relation to three pillars of practices: the body – including cognitive processes and physical dispositions; the material world – including technology and infrastructure; and the social world – including settings, norms, values and institutions. A change in any of these three pillars can shift a habit and indeed influence our overall dispositions. A change in more than one aspect would most likely lead to the dissolution of the habit. Addressing only one pillar may not suffice, for example introducing a new technology or influencing cognitive processes through awareness-building campaigns.

This calls for a further exploration of the concept of distributed agency in relation to practices (Wilhite, 2010). As defined by Ortner (1989), agency is the capability or power to be the source and originator of acts. If we are interested in change, we need to identify all of the agentive aspects of a particular practice, across each of the three pillars, or dimensions discussed above: body, objects and social contexts.

How do we see change as occurring?

If change can occur across each of the three pillars – body, objects and social contexts – how do people actually learn to change? For the body to learn new things, we can imagine repeated mental and physical exercises for example. For things to change, we can imagine people developing new designs, technological advances or changes in infrastructure, for example. For changes in social contexts, we can imagine efforts to change policies, the introduction of new laws, or public debates for example. The focus of this position paper is about how people learn to do things differently. In Sahakian and Wilhite, in press, we argue that you can consider all of the distributed agency potential across different elements of a practice. But when it comes to actually engaging people in change, we feel that social learning is a relevant theoretical framework, one that considers 'learning' as an engagement in and with new practices.

Lave (1991) argues that learning comes about through cognitive and practical processes, which in turn lead to the acquisition of practical knowledge. For Lave (1991), learning should involve two stages: a broad understanding of what it is to be learned, then participation in the practice, what she calls situated learning in communities of practice. Learning is viewed here not as an individual experience but as participatory and social (Lave and Wenger, 1991 / 2009). The implication is that people should be given an opportunity to actively participate in more sustainable practices – which could be achieved by participating in 'demonstration projects'.

Examples of demonstration projects

Demonstration projects were used extensively after the Second World War to engage (mostly¹) housewives in using new appliances, such as the washing machine, with marketers striking a delicate balance between freeing up women's time in the home, and selling products that promote the idea of the perfect housewife (see Pérez, 2012 for an example of the links between gender, consumption and refrigerators in post-war Argentina).

Could demonstration projects help shift practices towards areas that have a lower environmental impact? In Europe, there is consensus on what consumption areas have the highest negative impact in relation to a range of environmental indicators: transport, food, and heating homes (Tukker et al., 2006). This paper discusses food consumption in Europe. While there is no comprehensive data on the high impact areas in other regions, this article also considers energy for cooling homes and food consumption patterns in the Philippines, as I have just returned from 11 months in Metro Manila. What I provide below is a brief summary of how certain people changed their consumption practices in relation to demonstration projects.

Food and beverage consumption

In Sahakian and Wilhite, in press, three empirical examples are presented in relation to food and beverage consumption. They are summarized here with a focus on the 'demonstrative' aspect:

- *London on Tap Campaign*: reducing bottled water has become emblematic of environmental campaigns not solely because of impacts, but because safe and clean tap water is readily available in certain contexts. As Wilk (2006) has discussed, bottled water is an example of how to get people to pay for things that are abundantly available around them. One example to promote tap water was the *London on Tap* campaign, launched in partnership between the City Mayor and Thames Water, the utility company. In 2007, different information campaigns around tap water were disseminated but none were successful in and of themselves: a blind taste test found that tap water was rated third out of 24 varieties of water, including 23 bottled waters. The price and health benefits of bottled water were also discredited. The campaign then focused on a specific practice: ordering bottled water in London restaurants. In a survey, people were said to be embarrassed to ask for tap water in that specific context. A new water carafe was designed for restaurants, and these establishments encouraged guests to order tap water and use the new carafes. Bottled water sales were reduced by eight percent in the summer of 2008 during the restaurant campaign. What is lacking is data on the long-term success of the program, and whether this change in a public space had any affect on other practices, such as household water consumption.
- *Putting Oklahoma City on a Diet*: another city-level campaign began with Mayoral concerns that the city was a regular fixture on ranking lists for obesity and general un-healthiness. While the Mayor recognized that city infrastructure was a main issue (ie, car driving culture, with limited opportunities for walking or biking), he also created a community of practice around healthy food entitled 'City on a Diet' in 2007, with the goal of getting the population as a whole to lose one million pounds (450,000 kg) – starting with himself – and by creating an online interface

¹ Certain household products were also directed to men, such as the barbecue grill and cooking knives. In a 1957 issue of *Popular Mechanics*, directions are given on how to construct an oil-barrel type grill. The main image that accompanies the article portrays a man in a chef's hat preparing a meal on the grill, with a woman standing by to serve the guests (Sahakian Wilhite in press).

where people could share experiences and stories. Camps for people with obesity were set up around the city, allowing people from similar age groups to meet and share their personal stories on weight loss with their peers. The one million pound target was achieved in early 2012 for the city as a whole, with the Mayor himself losing 38 pounds since April 2007. More than 47,000 people recorded their weight-loss efforts online as part of this campaign.

- *Promoting local foods in Geneva:* this example is based on two women in 2008 in Geneva who started offering vegetable baskets in their neighbourhood, based on relations built with local farmers. The goal was to promote seasonal, local produce and build social relations – both with farmers and with neighbours. They realized that certain people did not know what to do with some types of seasonal products in the basket: the black radish, for example. They began offering recipes but realized that reading about the use of a new vegetable would not be sufficiently compelling to incite people to use that vegetable in a meal. They believed that they would attract more people to their products if their clientele could experience these recipes first-hand. The concept of the restaurant as a demonstration project was therefore born out of a desire to stock certain products in a local store, but also to show how these products can be used and to create a place where people can dine on mostly local products. The restaurant has been operational since 2011, with vegetables playing a central role (meat/fish/poultry is also offered on some menus, to promote local animal raisers, but the priority is given to vegetables). The meals offered in the restaurant demonstrate new ways of cooking seasonal vegetables, and are offered along with recipes for people to try out in their homes. Certain customers have given positive feedback, explaining that they were proud to serve these original dishes to their own guests at home.

Based on research conducted in Manila in 2013, the following examples related to food consumption also show the value of demonstration projects:

- *A new vegetarian restaurant:* the founder of Corner Tree Café, one of the few vegetarian restaurants in Metro Manila, explains how she turned to a vegetarian diet in her forties. This shift was based on a trip abroad visiting a relative in London, who is a vegetarian. The friend she visited prepared all kinds of delicious meals that she enjoyed, as she told me. She realized through that experience that meat did not have to be central to her meals and she did not ‘miss meat’. Growing up in the Philippines, she had been raised with what she described as a ‘very meat and rice diet, with many fried foods’. Still today in the Philippines, a ‘vegetarian’ meal usually means vegetables cooked along with pork or shrimp ‘for the flavour’, as people will explain. At the same time, she deplored the fact that more people do not switch to a vegetarian diet more easily. She opened her vegetarian restaurant to showcase what she calls delicious vegetable meals that can also be enjoyed by people who are not strictly vegetarian.
- *‘Organic’ food production and waste management:* The founder of a ‘organic’ food market in Makati, one of the most affluent cities in Metro Manila, explains that much of what she learned in terms of food production and distribution was gained while living in New York City in the 1980s. She returned to the Philippines in the 1990s and fell sick from the types of foods she was served, at her parent’s home and in restaurants. She claimed that health was the main reason she was interested in promoting a more organic, vegetarian-based diet in the Philippines. She founded a farmer’s market and an association, and works with farmers around

the country to transition towards less chemicals and pesticides in their farming practices. In the example of one farmer who is selling organic fertilizers at the local market, he returned to the Philippines after fifteen years in California. When he returned, he wanted to start an organic farm and invited friends from the West Coast to the Philippines to help him design his farm. Another man who started an organic waste management system learned about composting in a visit to South Korea. He also invited 'experts' from his visit to come back to the Philippines and become partners in his new composting enterprise.

Energy consumption

The following examples related to energy consumption also show the value of demonstration projects and are further elaborated in a forthcoming book on air-conditioning in Southeast Asia (Sahakian, In press 2014):

- *Making a home energy efficient:* this example is about how a person and his family decided to make their home more efficient. The male household head started by looking at the main appliances that he considered to be most energy intensive: the electric water pump, three air-conditioning units in the bedrooms, and the refrigerator and freezer. With his family, they made changes to reduce consumption, which in some cases involved the installation of more efficient appliances. For the air-conditioning unit in the children's rooms, he told me that he had to gradually increase the temperature of the room at night from sixteen degrees to twenty-three. This took several months, as well as changes to their bedding. His efforts at one point were halted, as he felt he had done all that he could do to reduce energy at home. His decision to consider energy sources and introduce solar panels on his roof came about after visiting a friend's home where the installation had already been made. I asked if he would have made the decision based on information alone and he responded that he would not have, as he feels that most information is about 'marketing' and could not be trusted. He did trust his friend and his friend's experience, however, and by seeing and hearing firsthand about the solar panels, he was sufficiently convinced to do the same. I asked if it had proven to be a good return on investment, to which he responded: 'you don't think about ROI when you buy a couch, do you?' Cost savings was not the most important factor for his decision.
- *Making buildings more energy efficient:* there are currently no building standards in the Philippines that promote high-energy efficiency. The Philippine Green Building Council is promoting a voluntary scheme, but examples of energy efficient buildings are few and far between. For many developers, promoting a 'green' housing development means planting trees in gardens. A commercial building recently received a gold rating via LEED: this tower of glass (using low emissivity windows) is promoted as the most ecologically sound building in the Philippines (a tropical country that is humorously said to only have two seasons, hot and hotter). Older buildings made with small windows and thick walls are seen as non-ecological, as the notion of what is 'ecological' seems to be tied up with the idea of large window openings and green landscapes. One self-taught architect is going around poking holes in people's homes, as he puts it. He creates openings that allow for passive ventilation, but he encounters much resistance to this basic strategy for indoor cooling. He claims that only his friends allow him to take such measures in their homes. When you are physically standing on one of his buildings, it is noticeably cooler than it is outside. He tells me that people are always satisfied

with the results but that ‘opening a hole in the roof is like opening a hole in the mind’.

Discussion

The idea of promoting demonstration projects may be a rather simple one: it is about learning by doing. Perhaps one contribution of the combined social practice theory and social learning approach is that we don’t just learn by doing, we also have to understand what it is we are doing and be engaged with the new practice, which can involve interacting with things, but also other people, and challenging some preconceptions or norms that we implicitly adhere to.

Some of the main points we can glean from the examples above are as follows:

- *Bringing back learning from ‘elsewhere’*: in some examples, people went elsewhere to learn new ways of doing and saying. Should we actively be promoting more direct experiences such as these, where people are physically brought into a new context to experience ‘sustainable’ practices? Should this be between regions of the world, or can it be done virtually online? Who should be the focus for such types of experiences, ie students, practitioners, policy-makers, etc.?
- *Practicing a new product*: interacting with a new product seems to be part of demonstrating, as people can become comfortable with the ‘innovation’ or ‘change’ before acquiring it or adhering to it themselves. For example, people trying new vegetables in restaurants before cooking them at home, or seeing solar panels on a friend’s roof before installing them on their own. Do we need to have more spaces where people can directly experience a new product or service? Where would we set up these demonstration sites, at the workplace, in public spaces, going door-to-door among households?
- *Challenging implicit norms*: there seem to be some assumptions people take for granted that deserve to be challenged. Why are you comfortable sleeping at 16 degrees? Why do you associate an ecological home to glass tower? Why are you embarrassed to ask for tap water in a fancy restaurant? Why is meat central to your meal? Through the practice approach, one could try to uncover some of the implicit norms and expectations tied to ‘unsustainable’ practices and bring them out in the open. However, as discussed elsewhere (Sahakian and Wilhite, in press), this may lead to reaffirming the norm or even pushing the norm towards more ‘unsustainable’ pathways.
- *The importance of trusted social networks*: peer-to-peer groups that share stories and experiences, or the opinion of friends, are arenas where trust seems to be high. We are seeing new forms of sharing through collaborative consumption that are also based on relations of trust and build on new technologies that facilitate peer-to-peer networking (see Botsman and Rogers, 2010). Identifying trusted networks or sources seems to be an important factor in successful demonstration projects.

Some of the issues these examples raise are:

- *Time factor* or can demonstration projects be sustained over time? The London on Tap and Oklahoma City Diet are both Mayoral campaigns. What will be their rate of success over time or once a Mayor is no longer in office? How can we be sure that by demonstrating something once, or over the course of a season, or a year, we can sustain the change long-term?

- *Space factor* or can demonstration projects be extended over space? Cultural context seems important, yet certain practices are carried from elsewhere and brought back. How can new practices be shared among more people, from niche to mainstream, from micro to macro? Perhaps virtual demonstrations are significant, as the Internet has the possibility of reaching across spaces.
- *The learning proposition*: learning a new practice should probably involve a clear understanding of the learning proposition, or what 'sustainable transition' we are seeking to promote. By promoting a healthier lifestyle in Oklahoma, will people travel to exotic destinations for health treatments, for example? What is the 'learning proposition' and are we even clear within the research community as to what we mean by 'sustainable consumption'.
- *What's missing*: what are we demonstrating and not demonstrating? Perhaps one significant finding is that there are plenty of things we are not demonstrating as a society. In Manila, we are not demonstrating energy efficient housing. More generally, global media are not demonstrating sustainable lifestyles. Telling stories and showing examples of what it means to live sustainably seems to be lacking. No doubt visioning and back-casting techniques are working in this area.

I look forward to discussions around this position paper and how it might be relevant to other research towards sustainable pathways, as well as opportunities to further develop this research theme.

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Community gardens as learning spaces for sustainable food practices

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Abstract

Urban agriculture is an emerging topic and it is widely argued that it has considerable potential for sustainable consumption and production. Community gardening is a promising type of urban agriculture and questions have been raised like whether it has additional benefits for sustainable lifestyles and behavior, and we can understand community gardens from a social practices perspective. This paper aims to provide first insights to these questions by looking at community gardens in the city of Rotterdam in the Netherlands, when aiming at more sustainable urban food provisioning practices. Two cases are analyzed using Shove's image-, skills-stuff model, while also looking at learning processes, expectations and enrolment of involved actors. Data have been collected, through participatory observation and semi-structured interviews.

There are both similarities as well as major differences between these two gardens that influence the food provisioning practice of participants as a whole. This study also shows that there are not only innovative developments pointing towards sustainability as well shared elements with less sustainable mainstream food provisioning practices. The former can be seen as opportunities that are not yet taken, whereas the latter are barriers that withhold the practice from changing. These insights improve our understanding how urban agriculture can play a role in a transition to more sustainable food provisioning practices. In addition, the role of the participants has found to be essential in the evolution, reproduction, changing and sustaining of urban food provisioning practices.

KEYWORDS: *Urban agriculture; community gardening; practice theory; grassroots innovations; sustainable consumption; sustainable urban food provisioning*

Introduction

Urban Agriculture

In recent years urban agriculture, the practice of growing food within cities, has gained a lot of attention and is becoming an increasing urban activity in Western countries (Corrigan 2011; Veen 2013). Also in the Netherlands urban agriculture is gaining interest and the number of initiatives is growing. The practice of growing food within cities comes in various forms, such as allotment gardens, guerrilla gardening, balcony gardening, school gardens, rooftop gardens, community gardens, etc. Even supermarkets are picking up this trend – of growing your own food - by selling compost, soil and edible plants. The increasing interest in knowing where food comes from and participating in growing food is also reflected by the growing number of local farmer markets and organic markets and a growing number of workshops, blogs and platforms helping out new urban growers (Brinks 2012).

Urban agriculture is not something new though. It has been practiced since the first cities emerged. Ancient societies practiced agriculture to feed people from the earliest settlements, this made it possible for the first cities to arise (Steel 2011). In developing countries urban agriculture is still widely practiced contributing to food security and access to healthy and fresh food to the poor. Here, urban agriculture is often practiced out of necessity; a well-known case is Havana in Cuba.

In developed countries this necessity is not so prevailing, as food is readily affordable and available for (most) citizens. Research on Urban Agriculture in developed countries (e.g. Smit, Nasr, and Ratta 2001; Cohen, Reynolds, and Sanghvi 2012; Deelstra and Girardet 2000) link this trend to the growing concern among citizens on safety and sustainability of the food chain and a need for greening and social cohesion in their neighborhood. As such urban agriculture is perceived as part of the transition to a more sustainable food system in Western countries.

Research in Western countries has shown that urban agriculture adds beauty to the city and provides space for urban dwellers to relax and recreate (Gardenworks 2006). Moreover, it may contribute to the well-being of urban dwellers; it contributes to health and well being by involving urban dwellers in healthy, active work and recreation (Bellows et al 2004). This practical experience with fresh food is assumed to increase people's awareness and appreciation for living things (Gardenworks 2006) as well as their understanding of growing and seasonality (Bellows et al 2004). Some authors (e.g. Deelstra and Girardet 2000; Cohen et al 2012) claim that urban agriculture may also change the perception of urban dwellers regarding food. They claim urban dwellers to have more interest in food-growing processes and the biophysical processes involved if crops are cultivated locally. Through agriculture and environmental training and education their knowledge on food growing processes then expands. This may enhance the influence urban dwellers have on the way food is produced; when they better understand what sort of inputs are used in the farming process, they can better and more quickly respond to harmful environmental practices (Deelstra and Girardet 2000). In the end this may positively influence dietary habits (Bellows et al 2004).

In the Netherlands it is expected that urban agriculture might positively influence health and dietary habits and contributes to raising environmental awareness and knowledge about more sustainable food choices (e.g. Hassink 2005). Jansma et al. (2008) argue that if urban agriculture produces green city areas that facilitate direct effects of producing fresh food locally, care, education and recreation, it could contribute to making cities more sustainable. Yet, if we place urban agriculture within the food system, these effects are

considered as limited in pursuit of making the entire food system sustainable (e.g. Kleis 2010). However, several authors, (Jansma cited in Kleis 2010; Duchin 2008; Weber and Matthews 2008; Tukker et al. 2010; PBL 2012), showed that eating local, seasonal and stop wasting food could deliver much more environmental gains than only trying to make a city self reliant on food. As urban agriculture is about much more than just growing food, those same direct effects of education, care, trainings, cooking classes and the like might help reaching those changes in eating habits.

Community gardening as a sustainable food provisioning practice

This paper focuses on community gardening as a promising type of urban agriculture with possible additional advantages (direct and indirect) for sustainable lifestyles and behavior. Therefore, this paper focusses on how we can understand it as a more sustainable food provisioning practice. So, the focus is not on urban agriculture as an instrument to provide fresh food or as part of a local food system, instead the focus is on the opportunities community gardening may have to bring about changes in food consumption behavior and food provisioning practices for instance through education, and raising awareness and interest about food production processes.

To understand the influence of community gardening on changing food consumption behavior, we consider behavior as a complex phenomenon of both dynamic agency and the social conditions of such agency (Halkier 2009). This means that behavior is not only driven by individual values and beliefs, and moves beyond awareness, perception, interests and knowledge. Instead, we use the theory of social practices, as used by Shove and colleagues (2005; 2012; 2007; 2005) and Spaargaren (2011; 2012). It not only provides a theoretical model that aims to incorporate the complexity of behavior, but it is also a dynamic approach in which individual behavior is considered to be part of the infrastructure and values that influences behavior and are thus also instrumental to creating them, rather than only being subject to it (Shove 2010). By now, practice theory is not only used as an analytical approach, but also more and more used as a design approach that addresses sustainability issues (Hielscher et al 2009; Kuijer and De Jong 2011; Scott et al 2012; Wever 2012 De Borja et al, 2010), as well as for developing future images of sustainable practices (Davis 2013, Doyle and Davis 2013). Also, in policy this approach may be valuable in formulating changing behavior towards sustainable consumption behavior (Spaargaren 2011; Shove 2010; Shove and Walker 2010; Spaargaren 2003; Hargreaves 2008). In this paper practice theory is to understand the potential of urban agriculture to bring about change in food provisioning practices, rather than to design or create policies.

By using social practice theory, food consumption behavior can be seen as a food provisioning practice, consisting of acquisition, preparation, consumption and disposal of food (McIntyre and Rondeau 2011). According to Warde (2005), the practice theory implies that the sources of changed behavior can be found in the development of practices themselves. So innovative food practices like urban gardening can therefore be considered as a niche development in the current food system. Viewing upon community gardening projects as a social practice niche or a grassroots innovation niche emphasizes its potential for sustainable development through widespread participation and calls for social learning (Seyfang and Smith 2007, see also Quist and Tukker 2013). So, community gardening does not only include the consumption of food and related stuff, but also the production of food and related stuff. In this way community gardening can eventually have a broader influence on broader food production and consumption practices.

The main purpose of this paper is now to analyze two community garden cases in the city of Rotterdam from a practice theory perspective and to investigate whether these

practices stimulate more sustainable behavior with regard to food consumption. The core question is whether community garden can be seen as a good learning environment for sustainable food practices. The remainder of this paper is organized as follows. The next section deals with theory and the applied case study methodology, which is followed by a case results section and a conclusions & discussion section, respectively. More details can be found in Vercauteren (2013).

Theory & Methodology

Overview of practice theory

Theory of social practices emerged within the field of sociology as a conceptual attempt to put social practices – instead of individual actors or social structures- as the central unit of analysis. Authors as Pierre Bourdieu (concepts of habitus and field) (1984; 1992), Anthony Giddens (theory of structuration) (1984), Bruno Latour (1992), Michel Foucault (1977) have provided major contributions to its development. More recently, Schatzki (2001, 2002) and Reckwitz (2002) made serious efforts to synthesize and connect these inputs into a more comprehensive analytical approach to social life. Reckwitz's (2002) article provides a clear overview of the theoretical aspects so far and makes a clarifying distinction between social practice theory and other cultural theories.

A key step was to put social practices central, and thereby bridging the dualism between agency and structure, was made by the recognition of the dialectical interplay between people's individual action (agency) and collective norms and regulations (structure); *'structures can only be established through actions of individuals, and simultaneously, these actions are formed by the prevailing structures'* (Røpke 2009, p 2491). Giddens' theory of structuration (Giddens 1984; in Røpke 2009) built on these ideas by formulating the interactions in which social practices become the mediating concept between action and structures. Examples of practices can be cooking, working, bathing, heating and cooling, taking care of others, writing, shopping, etc. Practices are often defined as a *"routinized type of behavior which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge. A practice (...) forms so to speak a 'block' whose existence necessarily depends on the existence and specific interconnectedness of these elements, and which cannot be reduced to any one of these single elements."* Reckwitz (2002, p 249)

A practice can only exist when an individual or group of individuals puts it into action. By using the theory of practices individuals become not only users or consumers, but also 'practitioners' or 'carriers' or 'agents' of a practice. They are producing and reproducing the practices. Since individuals are the agents performing a social practice, these social practices exist beyond the individuals who 'carry' them (Shove 2012). Just as individuals may take part in social practice and carry them, they may also change them, but also disengage, abandon, or resist a practice (Warde 2005; Scott 2008).

The organized constellation of action, through the carrying out of practitioners, can be seen as an organized entity (Schatzki 2002; in Røpke 2009). A practice is thus a (performed) activity and at the same times a pattern of activities shared by several individuals. To make a clear distinction between the practice as an entity on the one hand and the performed actions at the other hand Schatzki identifies two central notions of practice: first, the practice as a coordinated entity, consisting of both doings and sayings (cooking practices, voting practices, industrial practices, recreational practices, and correctional practices), which is the emerged outcome of the performance of practices and

refers to the on-going reproduction of practices. Second, practice-as-performance, which refers to the actual performance of this practice. It refers to carrying out of practices, performing of doings and sayings that *'actualizes and sustains practices in the sense of nexuses'* (Schatzki 1996; in Warde 2005). While the practice-as-entity refers to the abstract level of the practice, the practice-as-performance refers to the real life performance of a practice.

Shove's model of practices: Image, Skill, Stuff

Shove and colleagues have introduced a simplified model of social practices. They describe a practice as a configuration of three main elements; Image (meaning), Skill (competence and knowledge) and Stuff (the resources, materials, etc.). 'Skill' covers competences, know-how and techniques needed to carry out a practice. Through experience and training these become embodied in practitioners. Knowledge can be transferred between people, but this may need codification into rules and social norms, definitions, instructions and understandings. Although competences are embodied in the individual, it is seen as part of the practice and through its sharing of the social (Røpke 2009).

'Image' relates to the social and personal meaning of practices, it is about making sense of the carrying out of practices. These include the ideas behind the why, the emotional aspects and forms of self-representation. These can again be shared through understandings, e.g. doing something healthy, and are so connected to the social, including social identity and appearance (Røpke 2009; Scott 2008). The material aspects are covered by the component 'Stuff'. These include objects, equipment, technologies, structures, bodies of body parts needed to perform practices (Røpke 2009).

The three elements are depicted in Figure 1 and should be understood as broad categories covering a range of aspects. There are no clear boundaries in relation to one other and the connection or linkages between these components are made by the practitioner (Røpke 2009). Through doing the practice the components are partly embodied in the practitioner self.

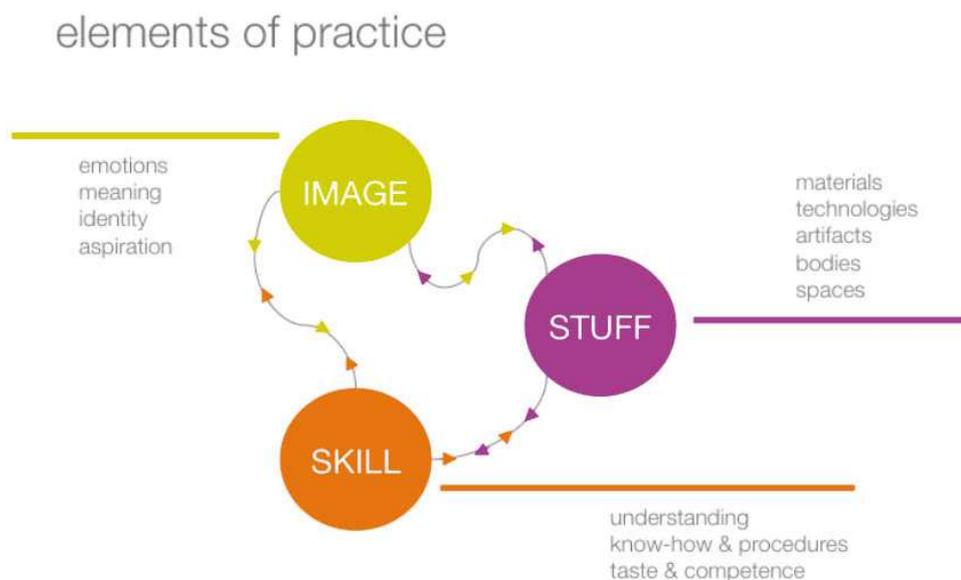


Figure 1: Elements of practices based on Shove et al (2007) and McMeekin & Southerton (2007), as depicted in Scott (2008)

A practice only exists when practitioners perform its activities over and over, and has therefore a temporal nature. As such a fourth elements 'time' could identified (Scott 2008). Scott describes how we can see the image-skill-stuff-model as a frame in a film, which is only a momentum of the full story. **Error! Reference source not found.** 2 shows, building on Shove, demonstrates the role of routines in recreating practices as linkages are maintained through each performance, yet might change and so practices evolve over time (Scott 2008). Practices are also subject to change and innovation. Practice innovation, and even fossilization, occurs through the creation of new links and breaking up of existing as small changes stack up, or as a result of the introduction of new ideas, new products (e.g. from analogue to digital cameras), new procedures or even through the linkage of existing elements, such as bike-sharing programs in European cities (Shove et al. 2007; Scott 2008). As some practices fossilize the knowledge embodied in those practices is often lost (e.g. the use of the old telephone in contrast to using a mobile phone, or the decrease of knowledge on fresh food through ready-made ingredients).

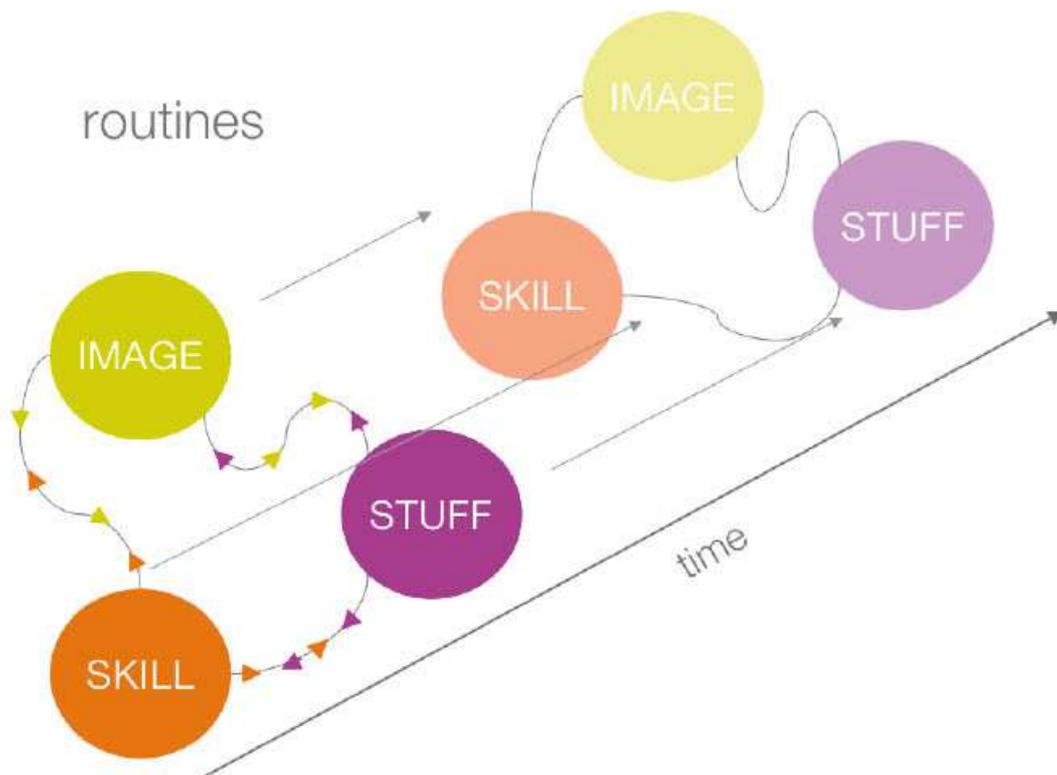


Figure 2: The reiterative performance of a practice over time, based on Shove et al. (2007) by Scott (2008)

Practice theory as used in this paper

In this paper Shove's Image-Skills-Stuff model is used to analyze community gardens as practices in performance. To do so the social practice is in this paper configured according to McIntyre and Rondeau's (2011) food provisioning concept, making it easy to identify the involved sub-practices. McIntyre and Rondeaus (2011) described food provisioning practices to consist of (i) acquisition through growing and shopping, (ii) preparation, treatment and cooking, (iii) consumption or eating, and (iv) the disposal of food. By the

use of the concept of food provisioning by McIntyre and Rondeau (2011) 'acquisition', 'production' and 'consumption' can thus be integrated in one practice-as-entity. Individuals are then neither only producers nor only consumers. Furthermore, the food provisioning practice is represented in this study as an innovative niche-practice within the current food system. Doing so emphasizes the potential for sustainable development (both in practices and innovations) of community gardens, through widespread participation and calls for social learning (Seyfang and Smith 2007).

The model of Shove can be applied to so-called Do-It-Yourself (DIY) practices as Shove has shown (Shove et al, 2007). Whereas Shoves work assumes that practitioners are rather homogeneous, in our study a DIY community practice is studied in which practitioners have different roles. Therefore, more attention is paid to the role of the actor by looking into aspects like (i) the different social networks actors are involved in, (ii) the different power and hierarchical relations between practitioners, (iii) the different capacities and performances of practitioners (see Warde 2005), and (iv) the involvement of actors.

Methodology and case selection

Case studies using, participatory observation and semi-structured interviews with participants have been used. These have resulted in the identification of practice-as-performances and how these build up to a practice-as-entity at the level of a community garden. The cases have been selected in the city of Rotterdam, one of the leading cities in urban agriculture in the Netherlands. Other criteria were (i) that the gardens are within the boundaries of the city; (ii) that the gardens exist for several years, and (iii) that the gardens are grassroots initiatives initiated and organized by citizens or local communities. Sometimes, there is collaboration with public or private organizations, but key to community gardens is that people work together in a shared garden, and that they do not have separate plots. Although this does not imply that participants share everything; participants may have specific roles and activities in the community garden. Work is often divided among participants so that everybody has their own role in the community garden.

Selected cases based on the criteria discussed above are the Gandhi Garden and 'Garden at the river Meuse' in Rotterdam. The Gandhi Garden is a community garden initiated by members of the Rotterdam Transition Town network. The association holds a strong vision for an alternative economy and views upon the community garden project fitting in this vision. The 'Garden at the river Meuse' represents a community garden initiated by neighbors, who wanted to transform a neglected empty building plot into a nice environment for the neighborhood. They created a community garden at the head of the pier next to the river Meuse. There are both similarities as well as big differences between these gardens that influence the food provisioning practice as a whole. Table 1 shows some characteristics of both cases.

Table 1: Characteristics of selected cases

Characteristics	Gandhi Garden	Garden at the river Meuse
Number of participants	20-25	±9
Size	2000 m ²	±1400 m ² (Including a small fruit orchard)
Starting year	2011	2010 (since association, but the garden was there since 2007)
Initiators	Transition Town members	Neighbors
Association	Peace Garden (Vredestuin)	Garden at the river Meuse (Tuin aan de Maas)
Farming style	Permaculture	Conventional, partly organic
Important values and vision	Everybody is welcome, inclusiveness, connecting people, sustainability, peaceful and justice	Liveable neighborhood, social cohesion, it about the process of growing together more than the product, everybody is welcome

Results

Gandhi Garden (Gandhituin) in Northern Rotterdam

In 2011, when several school and senior allotment gardens at the Gordel road became available, members from Rotterdam Transition Town and a local neighborhood community joined forces to ensure that these gardens would stay. The association 'Vredestuin' (Peace Garden) are officially the initiators of the Gandhi Garden. They joined forces with the Transition Town network and responded also to a request of the municipality to create a community garden; the municipality wanted a garden that is freely available for the neighborhood.

The Gandhi Garden is thus a neighborhood garden where everyone is welcome to participate. Currently, about 20 to 25 people work and participate on this garden during two days a week (Tuesdays and Sundays). The association also wants the Gandhi Garden to provide possibilities for people that mostly need a garden, the work and its fruits. The association clearly states this on their website, and this is also reflected in the group of participating gardeners; the mixed group includes both temporally and long-term unemployed, as well as people incapable to work. The initiators, and thus the Peace Garden association also want everybody to participate in decision-making, although the Peace Garden association has a final say if plans do not follow the vision of the Gandhi Garden. The vision includes the following statement:

“What is needed to cope with the global social and ecological crisis of our modern world is a growth of humanity, compassion and love. In an inclusive, sustainable and non-violent economy, which is produced for needs and for those who are most in need (poor and oppressed), the world will offer an abundance. Through the Gandhi Garden we want to show that such a world is possible if we change our everyday local life.” (Gandhituin 2011).

The vision is also based on permaculture gardening, Transition Town philosophy and Gandhi's vision of a non-violent and non-exclusive society. The vision also builds on the three principles of Transition towns: Heart (living center for the neighborhood), Hands (permaculture garden) and Head (education center).

'Garden at the river Meuse' in Delfshaven, Rotterdam.

In 2002 the first apartment building named 'Eendracht (Concord)' was completed on the Mullerpier (Lloyd quarter) next to the river Meuse. The owners of these apartments were still living in a sandy and muddy place, but found each other and shared their pioneering experience. In 2004, several other apartment buildings were completed, but the head of the pier was still a sandy empty space, which raised considerable discontent among residents. Therefore, the residents of 'Eendracht' handed in a so-called Green Thumbs 'Groene Duimen' plan at the municipality to create a green space at the head of the pier, as long as no constructions were started. The plan included a grass area, a slide, a picnic table, a terrace, a vegetable garden for the local school children, a football field and a bowling alley. The municipality approved this plan and provided funding. The idea of the municipality was to give this empty area a temporary functionality for the neighborhood, though construction would start within two years (LloydKwartier Rotterdam 2006). However, three years later, the construction had not started yet, and also the school garden had not been realized. Therefore, some of the residents took up the garden themselves and started to experiment with some plants. In 2010 a small group decided it was time to take it serious and they registered an association for the 'Garden at the river Meuse.

The association and the municipality came to an agreement that the neighborhood could take care of the garden for as long as there are no plans for construction on this what was called a 'White Spot'¹. At that time the municipality expected building to start in 2017. Since this announcement the garden has become a tidy garden consisting of a vegetable garden, a green and flower garden (with several plants donated from the neighborhood getting a second life here) with benches and since 2012 also a fruit orchard. The association has four members (five at the start), but several other residents also work regularly in the garden, making a core group of about eight people. The garden is open to everyone in the neighborhood to come and help, yet most of the participants are from the 'Eendracht'(Concord)building (only one person in the core group is from another building). The association refers to an "open garden" as anyone can contribute to the maintenance of the garden. Apart from the core group, also children and other neighbors occasionally help. Usually, the participants gather on Saturdays; such garden workdays are announced on the website and the association's Facebook page. There is no obligation to work in the garden, and this results in some uncertainty about how many people will show up. According to the initiators this varies considerably, depending on the weather.

Food provisioning practices in the two community gardens

The food provisioning practices of the two cases have revealed several interesting differences and similarities. First, we will briefly explain the steps within the food provisioning practice as performed on these community gardens and describe both stuff and activities. These differences between cases influence the food provisioning practice at study in different ways. Although the cases are quite different in set up, goals and vision, working methods and process, the 'individual' food sub-practices, such as cooking, eating and preparing are quite similar. By contrast, in the disposing of food waste and food shopping there are notable differences.

Acquisition through growing:

The first step in the food provisioning practice is the growing of food. Growing has many variations in performance depending on both the practitioner and the context. The

¹ It is a construction site with virtually no maintenance from the municipality, as there are plans to build here.

growing process, especially in this community type of growing food, needs different roles to successfully produce vegetables. There is a need for leadership and coordination. These roles are not always fulfilled by the same practitioners, which also lead to changes in the performance per practitioner, as well as over time. Leadership and coordination can be seen in different organizational parts of the growing process: there are leaders in deciding what and when to grow, leaders in dividing the tasks, and leaders in taking up responsibilities. These roles change the context of performance for other group members and define the outcome of the growing process. Warde (2005) argues that we can differentiate between the contribution of practitioners to the reproduction and development of the practice on the basis of their role and expertise. This can clearly be seen in the decision-making about what to plant, when to plant, what needs to be done, etc., but also in how those that are less involved in the decision-making perform their role and tasks. For instance in the case of the 'Garden at the river Meuse' the building and maintenance of the benches and fences plays an important role in maintaining the garden as a nice place to be, which is vital for the continued activity of participants in the garden. And in the case of the Gandhi Garden the expert permaculture knowledge of the association members is essential for the structure and planning of the whole garden, which defines whether harvest will succeed or not.

Acquisition through shopping

The vegetables from the garden do not make participants fully self-sufficient in vegetables; most of practitioners' vegetables needs to be purchased. There is a slight difference between the cases as they buy different stuff at different places. In the Gandhi Garden case mainly organic vegetables and fruits are bought, often taking seasonality into account. Yet some performances do not fit in this picture as some practitioners face extra (financial) barriers. Those who buy organic vegetables, buy these at organic stores and to a minor extent in supermarkets. Criteria used to select vegetables and other foods include affordability and price, convenience, freshness, healthiness and organic (including both environmental and ethical & fair-trade considerations). The vegetables can be seen as the main part of 'Stuff' following Shove's elements of practice; as such we can see a difference in stuff between the two cases.

Planning or preparations

Planning or preparations may play an important role in sustainable performance of food provisioning practices. Carefully planning what to eat and using shopping lists might help in limiting food waste, as people only buy what they need. Several participants indicated to plan in front what to buy for a whole week. Incorporating the harvest from the garden, however, seemed a difficult task for the gardeners. Often this is forgotten to take into account when shopping, so it is taken as additional food. Whether this creates more food waste is unclear.

Cooking and eating

The skills and involvement in cooking differs among the practitioners. There is no shared way of cooking food among the practitioners in either cases. The practice-as-entity thus becomes a mix of different cooking styles in both cases and link to mainstream cooking practices. These practices differ in creativity, skills and expertise, meaning and value of food, expectations and perceptions and the foodstuff used. There is some relationship between cooking creatively with vegetables and the involvement in the garden. We can see that those taking up leadership and responsibility (on what to plant and seed) in the garden (regarding edible food) also are more eager to experiment with vegetables and

want to get the most out of a dish. They also eat less meat and fish. While those more focused on the action of gardening such as weeding and hoeing, and are mainly lead by others, also stick more to routine cooking. So the roles of practitioners in the garden are related to how they cook food. People who tend to be more engaged in their food, also value more the quality and aesthetic of their food going well together with more sustainable food choices such as organic and local food (Halkier 2009).

Eating together with the other participants highlights the role of social cohesion, norms and understandings. In the case of the Gandhi Garden the challenge is to make a delicious meal from scratch with vegetables from the garden. These meals are always vegetarian and sometimes even vegan; it is not even considered to serve meat. In summer these dinners are prepared together, when one practitioner takes the leading role and others help intuitively with both cooking and preparing dinner. During cooking and eating, people discuss what is healthy food and what the impact and consequences are of certain food choices. Eating together is about sharing and enjoying time spent together.

At the 'Garden at the river Meuse' group dinners occur in weekends when people were working in the garden or doing chores together. The dinners are not exclusive to garden participants only; other neighbors can join too. Although the neighbors eat together at a big table in the fruit orchard, these dinners are not per definition linked to the garden; these dinners are a spontaneous activity on summer days by any neighbor, food is prepared at home or on the barbeque. This means there is always meat involved. A few neighbors are not eager or willing to eat vegetables from the garden, and therefore vegetables from the garden are only used as an exception. Eating together is mostly a social event; it is about having a good time together with your neighbors and friends.

Disposal of food waste

Growing your own food provides opportunities to close loops; food residues can be composted and reused as fertilizer for growing new vegetables. In each case there was a compost, but it was not used for food waste produced at home. Compost is mainly used to dispose weeds, leaves, twigs and other things found on the garden itself. Unavoidable food losses and food waste from food consumed on the garden is thrown on the compost heap. This suggests that when food is consumed in another place or way than regularly – lets say out of the house -, people also deal differently with food. There is a reversed situation here; to throw away food losses and waste created on the garden as usual would require practitioners to collect and take it home, but obviously it is more convenient to throw them on the compost heap.

Differences in Image: Vision

Putting these two cases next to each other reveals the Gandhi Garden to be more innovative and/or radical than the 'Garden at the river Meuse' is. The Gandhi Garden initiative has a vision for an alternative economy emphasizing values likes inclusiveness, sustainability, peace and justice. Participants in the Gandhi Garden share this vision and try to apply this vision and values in the community garden and their daily life. This effects the image that practitioners have throughout the whole practice and is reflected in their performance as indicated above. The 'Garden at the River Meuse' does not share such a strong vision for change. The main goal is to share time together and do nice things together with their neighbors. The shared image is here less about growing food in a sustainable manner; rather, practitioners share a desire to do something effective together, such as growing food in the garden, but also constructing benches and other chores. In this sense the 'Garden at the river Meuse' initiative is less radical from a sustainable food perspective. Nevertheless, there are participants within the 'Garden at

the river Meuse' group that perform in more sustainable way; for instance, they experiment with different varieties and forgotten vegetables, or hold a vision for a more sustainable food system in which urban agriculture plays a major role. So, these persons influence the growing process in the garden, also challenging some other participants' vision on food. Yet their visions are not shared in such a strong way as in the Gandhi Garden. Both cases have thus different visions and share different values, and the extent to which the vision and values are shared among the participants differs in the two cases too. This is essential for communities to successfully 'do things differently' and to reproduce these alternative practices (Seyfang 2007).

Differences in Skills: growing expertise.

The difference in visions also comes with a big difference in growing skills. Within the Gandhi Garden group a few hold expert knowledge in permaculture, organic farming, and biodynamic farming. This means everything on the garden is organic and grown according to permaculture principles. At the 'Garden at the river Meuse' Participants have been growing vegetables based on learning-by-doing and occasionally asking friends and family for advice. This results in a 'we do with what we have' attitude and way of working. It also affects the production; at the Gandhi Garden they work in a larger scale, with more expertise, but also in a more complicated manner and with much more organizational issues, while at the 'Garden at the river Meuse' they work on a smaller scale, yet some are really dedicated to it and thereby getting quite some vegetables for their own.

Conclusion and Discussion

Within this study social practice theory has proven to be a useful framework to analyze and understand the practice of urban food provisioning. This framework enabled to analyze and understand the on-going dynamics of the everyday life of these community gardeners, in which practices sustain, reproduce and potentially change. As such we can conclude that looking at community gardens from a practice perspective provides valuable and interesting insights and adds to the findings of previous research on urban agriculture. This research confirms some of the expectations for community gardens such as the educational, social and recreational value of community gardens and urban agriculture. But the use of the practice model by Shove using Stuff, Skills and Image as core elements of a practice also revealed how and what aspects enable and barrier food provisioning practices to change, sustain and reproduce. In general we can see that there is not only potential for change, but that there are also barriers that limit the extent of changing sustainable food practices. These are important insights if we want to better understand how urban agriculture can play a role in a transition to more sustainable food practices.

A second conclusion is that there are not only innovative developments in the studied practice pointing to enhancing sustainability, but also similarities or shared elements with (less sustainable) mainstream food provisioning practices. These shared elements often represent opportunities that are not yet benefited. One illustration from the cases is the use of compost within a neighborhood, which can directly facilitate the closing of loops within the garden and the neighborhood. By the use of the extended Skill-Image Stuff model, we understand that there are multiple barriers, such as routine habits and an existing waste treatment system that do not require such behavior, as well as lack of knowledge and skills, or even the motivation and norms (image) that would stimulate such behavior. We have also seen that there is potential for composting food losses, so that nutrients are reintroduced in the urban metabolism. As such we can see that parts of the

'old' practice form a barrier for this behavior and thus for change. The parts shared with the 'old' food provisioning practice do not have to be negative though. It is possible to identify several food experience and this could be linked to the taxonomy of Halkier (2009); food for pleasure, food as necessity, planned and controlled food and food for health. Halkier (2009) argued that food as necessity has the least potential for change towards sustainability and the results confirm this. However, Halkier also concludes that there is potential if sustainability is already part of it, and thus integrating growing your own –preferably in a sustainable way- is one step closer to integrating sustainability even in such food practices.

A third conclusion is that the role of the participants is important in the evolution, reproduction, changing and sustaining of urban food provisioning practices. This has two implications; first, a theoretical implication, as (some) social practice models tend to neglect the role and diversity of performers in practices, and second, this may have implications in how we can understand the opportunities of community gardens for more sustainable food provisioning practices. Different roles mean that people experience working in a community garden differently, but also contribute and engage in it differently, leading to different learning experiences resulting in different skills and knowledge development. This research shows that the role people take in the community gardens is related to how people deal with food in their daily life outside the community garden. As we have seen people have different engagements in food practice; some are very creative and love to experiment, while other stick to simple or controlled food practices. We can also see this in their role in the community garden; for instance participants who tend to experiment more with planting different vegetables, and take initiative to make suggestions for change are often also those who experiment more in the kitchen. Although this might be a personal, it also influences how other people work, e.g. role division, in the garden and thereby influences their learning processes, e.g. bringing new stuff and skills in the garden.

From the results and conclusions of this study several opportunities and implications for sustainability can be highlighted, also depending on the goals and vision of the initiatives. Looking at the consumption of the practitioners in the cases some have become more willing to buy organic, since they work in the garden but mainly as part of their entire experience of engaging more with food. Working in the community garden is an activity in line with this growing engagement. Also, a shared growing awareness and sharing discussions on the food system stimulate this choice, which was especially the case in the Gandhi Garden. There is also a growing awareness on seasonality, although the representation of seasonal shopping is limited to what supermarkets and stores provide. Learning is a valued process both for adults and for children. Participants acknowledged they learned more about plant and vegetables growth, and experience own grown food as having a better taste. Deelstra and Girardet (2000) argued that such learning may enhance the influence urban dwellers have on the way food is produced as they will better understand what sort of inputs are used in the farming process and can therefore more quickly respond to harmful environmental practices. The findings in this study are not conclusive on this; the causal effect of this learning on the food practice is difficult to identify and may need further study. Furthermore in this study learning and changing perception and consumption patterns are integral to social practices; there is no one causal between knowledge and performance, as it both based on learning-by-doing and doing-from-learning. The food production of both cases was too low to provide a major share of the participants' fruit and vegetable consumption This has influence on how these vegetables are perceived; it is an addition, a treat, but not a substitution. On the production side the two cases have a major difference; one case aims at producing food in such a way that it contributes to an alternative economy, while in the other case producing

food is only a part of it, the garden mainly facilitates a neighborhood preference for non-edible or edible gardening. In both cases this highlights the importance of social sustainability. We do not want to suggest causality between urban gardening in social cohesion, but the social aspects are certainly important aspects for the practitioners themselves. The two cases thus show how community gardens can contribute to sustainability in different ways, where one is more focused on social cohesion and community aspects, and the other aims to work towards an alternative economy by producing food in an alternative environmental-friendly and social way in which community aspects are of course important too. This shows that growing food is not only part of the food provisioning practice, as it is also a hobby and a social activity.

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Discussion Report

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Moderator, Tom Baulier, ULB

Organisation of the session

The working session on Individual Change and Alternative Consumption Niches was moderated by Tom Baulier and was organized as follows:

- First, there were 10 minutes presentations by (1) Marlyne Sahakian on a paper entitled 'Learning from demonstration projects on sustainable food and energy practices', and (2) Carmen Vercauteren et al. on a paper entitled 'community gardens as learning spaces for sustainable food practices'
- Followed by a discussion moderated by the chair Tom Baulier

Main discussion points on the paper by Marlyne Sahakian

Georgina Guillen raises the question of the follow-up of demonstration projects. The author answers that some demonstration project focus on an impact at the niche level but it is not certain whether they can lead to regime change. Jaco Quist adds that there is still limited research on long-term impact of demonstration projects.

The issues of perceptions and social norms came up in the discussion when the author mentions that in the Philippines (one of the countries of her case studies), whilst traditional bamboo houses with thick walls are rather energy efficient, Phillipinos see modern glass building as much more attractive despite their poorer energy efficiency. Adina Dumitru adds that the associations people have with modernity is a cross-cultural issue. For example, in East-European countries during the communist regime, nothing was wasted, but nowadays waste has almost become a sign of wealth. In China, cycling used to be a common practice, but nowadays it is associated with low status as there is the image that the modern person should drive a car. Research is needed on how to shape messages that show the values of some traditions.

Main discussion points on the paper by Carmen Vercauteren et al.

A discussion about the interpretation of practices in different cultures emerges when the author notes that, surprisingly, in one of her community garden case studies, the excess cabbage was thrown away. Eleni Iacovidou and Georgina Guillen mention both that in some countries, food waste is seen as a sin whereas in other, finishing your whole plate is considered a sign of greediness or of malnourishment. If the excess cabbage would occur in another culture, it would have perhaps automatically been shared among other people.

Another topic of discussion evolves around the motivation to start new practices and how motivations can shift in time. The author notes that in her two case studies there were notable differences of motivation to join a community garden; in one case people were motivated by the socializing aspect and not by the sustainable food production aspect, whereas in the other case people were driven by idealistic visions of a sustainable world. Eleni Iacovidou adds that in a community garden case study in Milan, people initially joined because they were unemployed and wanted to eat cheap food, but then they maintained the practice because of social and community reasons.

General discussion

As both papers presented in this session used a social practice approach, the discussion revolved mainly around the usefulness, challenges and future outlook of this approach. One point of discussion for instance was that practices are interrelated. For example, the practice of eating is related to the practice of getting together as a family. Such an interrelationship gives both opportunities and challenges. A challenge is for instance to define what a practice is and where to set the boundaries. On the other hand, the interrelationship between practices can lead to the discovery of what is really important to focus on and it can give a backdoor entrance to certain issues. For example, if one studies the practices in community gardens, one could discover that social bonding is more important than producing food so one could better focus on the former aspect.

The relative importance of both money and social context for changing practices was also discussed. There are cases where money is determinant, as well as cases where it is not can be observed. Carmen Vercauteren refers to people involved in organic community gardening, but who, despite having a strong vision of eating organic food, could not afford buying organic in the supermarket. By contrast, Marlyne Sahakian mentions an example where another factor like social status was more important than money. In one of her case studies, one person who invested in solar panels on his roofs said: "Do you think of ROI when you buy a couch?". Walter Wehrmeyer emphasizes the key role of social context and leadership. For example, Michelle Obama's involvement in community gardening is affecting mainstreaming this practice in the US.

A research agenda for social practice theory was also put forward. Ricardo Garcia-Mira suggests that practice theory could be linked to theory of social learning. Adina Dumitru suggests that the time dimension should be better integrated in order to understand the relationship between practices and time. She argues that for instance the work a-lot-and-spend culture is linked to very consumerist practices, but on the other hand leisure activities have been found to have a high ecological footprint in general. Marlyne Sahakian responds that time use methods, like diaries, are sometimes used in practice research.

Other further research questions raised include: How to facilitate changing practices? How to mainstream sustainable practices? How to kill unsustainable practices? What are the limits of mainstreaming sustainable practices? For instance how does taking into account the context and creating diversity combine with mainstreaming? How can alternative practices (e.g community sharing and urban gardening) be linked? How can the social practice theory be translated for policy makers?