

# INTERMEDIARIES AS INNOVATING ACTORS IN THE TRANSITION TO A SUSTAINABLE ENERGY SYSTEM

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**Abstract:** *In transitions of large sociotechnical systems, intermediary organisations can emerge as mediators in between several actor groups and facilitate collaboration towards common goals. They can support the establishment of new actor networks and the articulation and alignment of interests to bring about desired changes. In this article, current efforts towards a more sustainable energy system serve as an exemplary context of intermediary work. The field under scrutiny, demand-side management, aims to decrease energy consumption. Unfortunately, the role and work of intermediaries as implementers of demand-side management projects often remains underappreciated.*

*Research into the reasons of successes and failures of intermediary work and a theoretical corroboration for their practical work can help intermediaries to improve their programme designs and implementation strategies. The EC FP7-funded Changing Behaviour project aims to support intermediaries with strategic activities to improve demand-side management programmes and bring about lasting behavioural changes. Paying more attention to context, stakeholders, monitoring, evaluation and learning enables the development of tailor-made, widely supported projects with higher chances of success.*

*In addition to practical support for their work, intermediaries can benefit from stronger policy support. An appreciation of their work as contribution to policy implementation, e.g. towards energy saving targets, could motivate such support. A stable policy and financial environment with long-term implementation plans and funding schemes provides a fertile ground for intermediary activities. Active participation of policy actors in demand-side management programmes can create networks sustaining longer-lasting change.*

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**Keywords:** *energy intermediaries, sociotechnical systems, system innovation, transition management, energy efficiency, demand-side management.*

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## Introducing intermediaries: innovative actors in system transitions

One focus of science and technology studies (STS) is the co-production of science, technology and society based on the idea that scientific, technological and social developments influence and shape one another (Bijker, Hughes, and Pinch 1987). In other words, sociotechnical systems comprise (technological) objects, people, practices and common, organisational or institutional relations between them. The study of (social) practices is therefore central to an STS approach – also from the methodological point of view (Guy and Shove 2000). It aims to shed light on how changes in the networks of actors, objects and the relations between them can occur (Hughes 1987), be brought about, or possibly even managed (Schot and Geels 2008). Additionally, it allows analyzing how variation in a certain aspect of the sociotechnical system may have both planned and unforeseen repercussions throughout and long-term consequences for the system under scrutiny (Hughes 1987). The term “system transitions” has been coined for large-scale and long-term changes of such systems. The historical developments leading to and following changes in the transport sector (Geels 2005) or the (at the time of writing) still planned technological, organisational and behavioural changes in the system of energy consumption and production towards sustainability are examples of such system transitions.

In the context of systems innovation research, Van Lente et al. (2003) describe ‘systemic intermediaries’ emerging in long-term transitions towards a sustainable future as actors who are ‘useful and necessary but not sufficient’. While previously the focus of systems innovation research lay on institutions, Van Lente and his co-authors view the connecting, translating and facilitat-

ing role of intermediaries between institutions as crucial. The articulation and alignment of actors' interests are mentioned as the (necessary) functions of intermediaries. Additionally, intermediaries can support and facilitate learning processes for successful transition management. However, the authors conclude that appropriate policy support for the important tasks intermediaries perform is lacking.

Research on intermediaries in the field of sustainable water management provides additional insights into the innovative role of intermediaries in system transitions.<sup>2</sup> It allows improved understanding of contexts in which intermediaries emerge and operate, tasks they are able to perform across political and regional scales, and their roles in innovation and governance. While contexts, actors, scales and technological and social innovations vary in the context of sustainable water management, intermediaries are shown to possess the unique flexibility of developing their role and function in relation to all of the above. Thereby they are able to translate regulation into practice, transcend regional and organisational boundaries and reconfigure relationships between actors in order to facilitate changes (Moss et al. 2009). The same research points out that the interests of a number of actor groups can be served in pursuit of a certain outcome. For example, policy makers can develop water management strategies with the aim of nature conservation and public utilities can adopt them in order to achieve lower operating costs. Intermediaries are able to establish communication between these two parties, making them aware of their matching goals, thereby supporting coordinated efforts of otherwise independent actors (Moss et al. 2009).

The innovative role of intermediaries in the energy and environmental sectors can be described as one of 'bottom-up' policy implementers, as discussed further in the following section. Recognising the importance of intermediary work calls, on the one hand, for practical support of their efforts in terms of knowledge, skills and management. On the other hand, the importance of intermediary work also calls for better policy support (Van Lente et al. 2007). After a section introducing intermediaries in the context of the energy system and their potential role in a transition towards a more sustainable one, this article discusses possibilities for practical improvement of intermediary work in demand-side management based on results of the Changing Behaviour<sup>3</sup> re-

search project. Insights gained are used to extrapolate policy advice on better endorsement of intermediary work.

## Introducing system change: the importance of intermediaries in the energy system

Over time, the European system of energy production and consumption experienced various technological, economic, social and political changes. This section focuses predominantly on demand-side management (DSM) developments in the private residential energy sector. Energy efficiency made its first appearance on political agendas following the energy crisis in the 1970s. At that time, governmental measures to decrease private energy consumption were mostly of an educational and campaigning nature. However, the end of the crisis was followed by a swift return to 'business as usual' and lowered interest in DSM. In the following two decades, during which the energy sector was still mostly characterised by state-owned energy provider monopolies, states employed direct control of the market to enforce utility investments into energy efficiency. These utility-driven DSM programmes hardly proved to be successful. They were largely developed and implemented in a strict top-down manner and paid little attention to end user consumption needs. Therefore, these programmes, which were often set up as large sweeping campaigns, found few listeners and even fewer followers and their results were – if at all monitored – not very promising (Breukers et al. 2009).

Following the liberalisation of the energy market, governments lost their almost-direct regulative influence on DSM programmes. Energy efficiency remained or even strengthened as a politically debated issue with respect to security of supply, depletion of fossil fuels and climate change. The increase of energy efficiency has been recognised as the 'cheapest and most feasible' action to combat climate change (Heiskanen et al. 2009). And although energy efficiency measures account for most of the decrease in energy use in the last 30 years (Geller 2005) a large potential remains untapped. Estimates of this potential are subject to debate and vary per sector (e.g. private, commercial, transport). For the private residential sector, estimated savings potentials centre on 30–40% (Changing Behaviour Partners 2009a). Therefore, these days, energy policy in this sector rather focuses on measures to influence a liberalised market towards higher efficiency, e.g. consumer advice and energy efficiency services.

An economic view on the energy market reveals that its liberalisation and privatisation was accompanied by a diversification of actors involved and new

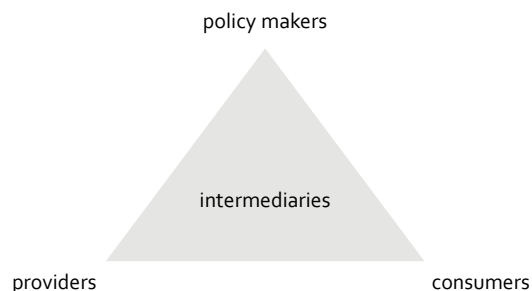
2 The fact that intermediary organisations emerge or take over emerging tasks in systems undergoing long-term transitions does not imply that they vanish again after transition completion. On the contrary, some may become institutionalised and permanent actors who carry out or manage relevant (and permanently needed) tasks.

3 The project was funded by the 7<sup>th</sup> Framework Programme of the European Commission under grant agreement number 213217.

constellations and tensions between them (Moss et al. 2009). One effect of market liberalisation was diminishing incentives for energy providers to promote energy efficiency resulting from their increased interest in high sales (Changing Behaviour Partners 2009a). However, public utilities became interested in energy efficiency again to manage peak-load demands, to gain a positive image and customer support, or to compensate for decreased consumption by providing energy efficiency services (Heiskanen et al. 2009).

This increased focus of policy and economic actors on energy services opened an operating space for a particular kind of actor in the energy system: energy intermediaries. Energy intermediaries could strategically position themselves between the then de-coupled state and energy sector and mediate the interests of both towards common (as well as own) objectives for a more sustainable and secure energy future. Furthermore, energy intermediaries could use their independence from either actor group to gain end users' trust, thereby featuring the promise to reconcile expectations and interests of all relevant actor groups towards increased energy efficiency. Different types of energy intermediaries emerged in different sectors and at different scales (e.g. project-based support of small-scale interventions or sector-based management of long-term transitions – see Breukers et al. 2009 for details). These examples indicate a common element of the operational space energy intermediaries occupy in different contexts: in-between other key actor groups (Figure 1).

**Figure 1** Three main actor groups in the energy system and the operating space of energy intermediaries



In other words, the character and work of intermediaries are defined by their 'in-between-ness', rather than their organisational structure or any particular focus of their work (Moss et al. 2009).

## Energy intermediaries in the context of private energy consumption

In the context of private energy consumption, intermediaries specialise in the development, implementation and management of DSM programmes. The types of energy intermediaries and their programmes or approaches to DSM are rather diverse. The different organisational forms energy intermediaries may take include, *inter alia*, non-governmental organisations (NGOs), governmental agencies or organisations, or private companies such as energy service companies (ESCOs), public utilities and consultancies. DSM programmes with energy intermediary involvement focus, for example, on reduction of energy consumption, implementation of renewable energy projects, education/communication campaigns, energy advice, and education or certification of energy advisors (Mourik et al. 2009a).

DSM programmes can be defined as "programmes, and initiatives employed to alter the quantity and patterns of energy consumption, and therefore necessary production, by focusing on end user energy demand reduction" (Changing Behaviour Partners 2009a, 4). Their potential for energy savings has been discussed widely and various, especially Western European countries, have made first, promising steps. Today, "negajoules", the energy that did not have to be produced because of policy-induced higher efficiency and lower consumption, are the single biggest energy source in Europe (Action Plan for Energy Efficiency 2006). Research has found that behavioural change can significantly contribute to energy demand reduction in a (theoretically) fast and cost-effective way (Dietz et al. 2009). Behavioural change cannot be easily accomplished, but intermediaries can be important facilitators of this process.

A successful example of demand-side management with intermediary involvement was the introduction of green energy labels for household appliances. Stakeholders included energy suppliers and generators, consumers and policy makers. NGOs, who acted as intermediaries in this case, were able to help negotiate and define energy standards, enrolling and reconciling between actors from across the supply chain, communicating with the general public, and thereby building trust for the labelled products. Furthermore, they established valuable links between appliance producers and policy makers that helped shaping policies at the national and EU levels (Rohracher 2009).

Despite encouraging examples of successful efforts, many projects and energy savings achieved still fall behind their actual potential. Research related to energy consumption behaviour in general and energy DSM in particular has shed light on the complexity of these issues in recent years. DSM programmes face a number of organisational, practical and financial difficulties. Behaviour

is highly habitual and at the same time highly diverse. Energy is only a means to perpetuating the great variety of lifestyles one finds within and across societies, and its consumption occurs in 'unconscious' and mostly invisible ways. Furthermore, energy use is deeply entrenched in the sociotechnical systems people lead their lives in. Often, willingness to decrease personal consumption makes people aware of their lack of empowerment (Breukers et al. 2009). For instance, a transport system may structurally favour private cars over public transport, or the arrangement of ownership in a building may prevent easy implementation of energy efficiency measures if, for example, several resident groups have to find agreement on the extent and type of measures and investment. Behaviour changes, in the form of consumption choices, can be induced, but sufficient time, information and support are needed, especially to increase the chances of lasting change (Stern 2000). Trust in the source of such information and support is another prerequisite for successful and longer-lasting change (Breukers et al. 2009). Several instruments are available for providing the required information, building the necessary trust and supporting behavioural changes. However, the effects of instruments vary, depending on factors like education, awareness, and (shared) understanding of goals (Allen, Kilvington, and Horn 2002).

Therefore, there is no 'one-size-fits-all' solution to the promotion of energy-efficient behaviour. Intermediaries bring several assets to the task of demand-side management, e.g., high flexibility and adaptability, expertise, independence and service orientation. In comparison to utility-driven DSM programmes, intermediary-managed ones rather employ bottom-up approaches built or centred on end user needs and concerns. Although they may not represent the conjured 'silver bullet' themselves, the aforementioned characteristics help to embrace the complexity of DSM, to cope with difficulties and conflicting interests, and to employ a variety of instruments for decreasing energy consumption. In the context of private households these instruments may range from public awareness raising campaigns, to energy efficiency community projects, to individual household energy saving advice. This is not to imply that intermediary-managed DSM programmes necessarily perform better than utility-driven ones – as said, they are not the 'silver bullet'. However, their background as independent actors and often their end-user-focused approach to DSM implicate increased likelihood of success due to increased trust and improved targeting of energy end users.

Researchers and policy makers have only begun to understand the valuable roles intermediaries can play in demand-side management, the kind and amount of practical and financial support they require and the use and effects of available intervention instruments. The European research project Changing

Behaviour, conducted by a consortium of research institutes and intermediaries, aims to develop and promote such practicable ideas for the improvement of DSM programmes and intermediary work. The objectives of the three-year project are, on the one hand, to improve the theoretical understanding of energy consumption behaviour and the possibilities to achieve higher energy efficiency. On the other hand, the theoretical knowledge gained is to be translated into intermediary activities that integrate new insights into their work and facilitate and improve DSM programmes.

The remainder of this article discusses this research project in more detail and presents its first results. This material is used to empirically substantiate the foregone theoretical discussion on the role of intermediaries in system transitions and their work with respect to energy efficiency behaviour. The concluding section ties the literature findings and research outcomes of the Changing Behaviour project together with policy implications and outlines recommendations for the work of energy intermediaries.

## Developing supporting activities for intermediary organisations

The three-year research project Changing Behaviour<sup>4</sup> aims to help intermediaries (and also policy makers as secondary target group) with the design and implementation of more successful DSM programmes. First, an inventory of 100 European energy DSM programmes revealed the diversity of intermediary organisations, instruments used and degrees of success in practice. Second, a conceptual model of intermediaries and their functions in programme implementation was constructed based on thorough literature study. Third, underpinned with the conceptual model, a more in-depth analysis of 27 DSM cases was conducted, focusing on the reasons of project success and failure. In parallel, four workshops with participants from intermediary organisations across Europe aimed to substantiate the understanding of success and failure and to learn from intermediaries' practical experience. The insights gained are currently being tested in six pilot DSM projects dealing with a variety of issues, e.g. energy efficiency education among teenagers, investment behaviour with respect to energy efficiency measures in private dwellings, and energy service company (ESCO) services for small communities. Finally, a set of activities is

<sup>4</sup> The full title of this EC FP7-funded project is 'Contextualising behavioural change in energy programmes involving intermediaries and policymaking organizations working towards changing behaviour'. For more information, please visit [www.energychange.info](http://www.energychange.info).

designed to help intermediaries increase the chances of success of their programmes. These activities are practical in their orientation and enriched by the workshop and pilot project experiences, but also build on the previously developed conceptual understanding of behavioural change in energy consumption.

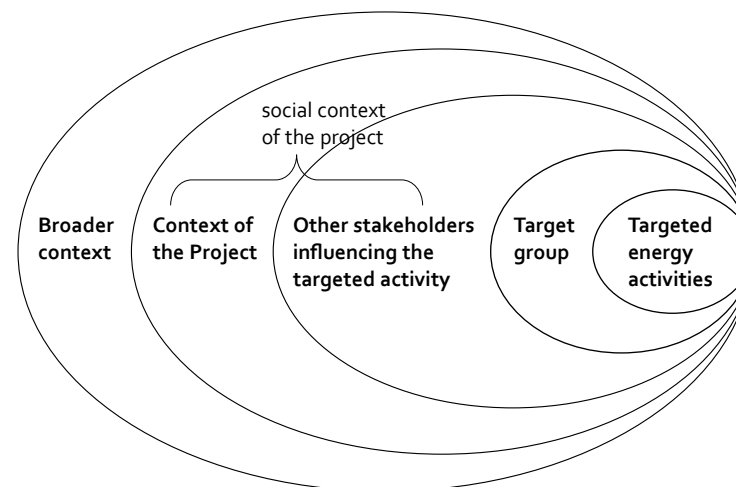
While action was previously sought for at the level of policy making (Medd and Marvin 2007; Van Lente et al. 2003), Changing Behaviour activities aim to help intermediaries set up practical programmes based on well-founded theoretical insights. The research carried out in the framework of Changing Behaviour underlines the importance of sufficient funding, commitment, relevant expertise and trust between stakeholders (Breukers et al. 2009). In addition, the following aspects have been identified as crucial: good understanding of the immediate and broader contexts of the DSM programme, firm establishment of a supporting network, thorough acquaintance with the target group and its motives or restraints for behavioural change, active engagement of relevant stakeholders, and focus on monitoring, evaluation, and learning. These issues that Changing Behaviour partners consider relevant for the improvement of demand-side management programmes are discussed in the following and illustrated by examples taken from the project case study database and pilot experience. For each proposition for improvement elaborated, potential policy implications are offered that can further enhance the success of DSM projects.

### Context-tailored project design

The context of energy demand refers to the sociotechnical system in which energy consumption behaviour is embedded. Based on a context analysis, the intermediary can identify relevant demand patterns, stakeholders interested in changes of such patterns, and the supporting policy frameworks (Breukers et al. 2009). The immediate context of the target group is also significant: are people in a position to engage in different behaviours, or is the support of, for example, a local authority or a building owner necessary? A thorough context analysis enables energy intermediaries as implementers of energy DSM projects to adapt project design to context. Understanding context as multi-layered aids such context analysis. Figure 2 shows how categorising context into a number of layers or levels helps to break down complexity.

An example from practice makes the different context layers and their relations more concrete. An energy intermediary developing a project targeting investment behaviour in order to improve the energy efficiency of private households could conduct an analysis similar to the following in order to inform project design.

**Figure 2** Understanding context as multi-layered (Mourik et al. 2009b)



The targeted energy activities could be defined as people's investment behaviour with respect to building renovation and improved the energy efficiency of their homes. The target group comprises all people this project would like to reach. The housing stock the target group lives in may be rather homogeneous, e.g. only consist of multi-apartment buildings in which most people own their flats; or it may be rather heterogeneous, consisting of apartment dwellings, single-family homes, semi-attached houses, etc. The target group itself may also be rather homo- or heterogeneous with most people being of similar or diverse socio-economic backgrounds. The knowledge of reasons for energy efficiency improvement of a building and readiness to invest may also be rather homogeneous or diverse. Better understanding of the target group's knowledge, concerns and motivation can greatly improve the design and approach of such a DSM project, as will be discussed in more detail below.

For further analysis of the context, the next layer is to be considered, consisting of other stakeholders that can influence people's investment behaviour and that can also be somewhat influenced by the target group and the energy intermediary. These may include the municipality, local communities, interest groups, renovation/construction companies, banks etc. All actors, institutions or organisations that may have an interest in the project and the power and means (e.g. required technologies) to influence its progress and outcomes together form the (social) context of the project.

The close context of the project is embedded in another layer which is usually beyond the sphere of influence of project stakeholders but still exerts power or influence on the project. This broader context in the example of investment behaviour with respect to energy efficiency can, for example, comprise a national policy for the energy efficiency of buildings, funding schemes for home renovation, (global) market mechanisms (e.g. the financial crisis after 2008), or national infrastructures for energy provision (Mourik et al. 2009b).

Since a DSM intermediary aims to create the most favourable conditions for behavioural change, it helps to think carefully about how contextual changes can trigger and sustain such changes or how a project needs to be designed to cater to the target group's context. This can be achieved by creating strong, cooperative networks across context layers and actor groups, as discussed in the following section. Additionally, some aspects of the project design, e.g. how the target group is approached, can benefit from a detailed context analysis. The Warm Zone project, one of the the Changing Behaviour case studies, which has been carried out in the district of Kirklees (UK) has been developed and implemented based on consideration of context and stakeholders. This very successful demand-side management project aimed to bring free cavity wall and loft insulation to all houses in Kirklees, irrespective of their residents' socio-economic background. An implementation strategy was developed with the declared goal to reach all homes, including those of people who spend little time at home or those of people who do not open the door to strangers. Accredited Warm Zone staff visited all houses, door by door, district by district. Local media were used to notify people of the imminent visit, and people who missed the personal visit received contact details to make an appointment. Households the project implementers called 'vulnerable' because their residents never opened their doors to strangers were approached together with a known person or caretaker or a password was agreed upon by phone beforehand. Furthermore, all construction work was to be carried out by a certified Warm Zone insulation company in order to ensure target group members' trust (Backhaus 2009).

Another example of careful consideration of project context is one of the six Changing Behaviour pilot projects that aims to improve energy efficiency of Latvian multi-apartment blocks. In order to plan and implement building renovation a 51% majority of residents is legally required. Originally, such vote for majority had to be conducted at a large meeting with one representative of each flat present. Not only are such meetings difficult to organise, but also the influence of (the often more vocal) opposition is more prominent at such meetings than that of those who are yet undecided or possibly already supportive. Recently, legal requirements changed and Latvian authorities allow the col-

lection of signatures from each flat. Now individual visits can be paid during which people's questions and concerns regarding building renovation and the financing thereof can be discussed openly. Such smaller, more personal meetings may also entail the risk of manipulation, however, if residents are put under pressure to agree to renovation plans. Both approaches, voting in large groups as well as signature collection in individual flats bear the risk of causing biased voting. The intermediary Ekodoma, an independent energy consultancy managing the pilot, welcomes this change in legal requirements and foresees easier discussions with residents and smoother pilot project implementation (Changing Behaviour partners [forthcoming]). To preclude manipulation, the building manager<sup>5</sup>, building elder<sup>6</sup>, and someone from Ekodoma could collectively pay flat-by-flat visits (ibid.).

From this practical advice for DSM project development and implementation, as proposed by the Changing Behaviour research project, follow ideas for policy contribution to the success of DSM projects. For example, when funding DSM programmes, time and budget can be accredited to conduct context analyses. Such analyses may include surveys, (expert) interviews and (focus) group discussions. Thereby, DSM project implementers are given the chance to learn about the context of their project and the specific requirements it may entail. Additionally, proposed DSM programmes could be granted certain flexibility in planning, design and implementation in order to integrate improved understanding of context into their further development. Policy can assist in this by keeping concrete project requirements in funding schemes open to context-relevant changes.

### Stakeholder networks based on shared objectives and trust

People do not make (behavioural) choices in isolation but always in relation to context. As discussed earlier, intermediaries are in the unique position of being able to bring together and align expectations and demands of a variety of actors across different contexts relevant to a DSM programme. Despite the fact that energy efficiency is the declared overall goal of DSM programmes, interests of several stakeholders can be incorporated and reconciled. Energy efficiency can be accompanied by a number of co-benefits. In order to

5 In Latvia, large building management companies take care of service and maintenance of multi-apartment blocks. Sometimes one of these companies also owns the whole or parts of the building.

6 The building elder is often the person living longest in the building and acts as mediator between residents and the building management company. He or she is usually well-known and trusted by all residents.

gain stakeholders' support those benefits that overlap or match can be fleshed out and communicated to the different stakeholder groups. If there is for instance a plan to renovate a building, the energy provider may benefit of diminishing peak load demand during heating periods, while policy actors may be interested in reaching national CO<sub>2</sub> emission targets, and the building tenants may be motivated to engage in the project at the prospect of increased living comfort and lower energy bills. Hence, it is important to make these different interests explicit and combine them toward the common objective of project success. This can be achieved by project networks with shared objectives and open acknowledgement of individual interests.

Broader 'contextual approaches' help in solving infrastructural or other dilemmas, i.e. the problem that many people do not have or do not perceive alternatives to their current behaviour. Community approaches can help solving social dilemmas, i.e. the problem of people feeling them doing 'their bit' will not induce sufficient changes. If the supporting network is broadened and individuals notice the contribution of others, such as their neighbours or their social group (e.g. school children), larger-scale changes can become a motivational factor for communities (Heiskanen et al. 2008).

Intermediaries are able to network a variety of actors, e.g. technology or energy providers, (public or private) financing bodies, policy makers, research or knowledge institutions, and the target group(s). A thorough (context) analysis of who may have an interest in the targeted behavioural change helps to overcome difficulties in the implementation of DSM programmes and may increase the longevity of programmes, e.g. by institutionalising a certain network of people or organisations.

Trust between actors plays an important role when building or entering such project networks. It is important that each actor group feels recognised and its needs and concerns taken seriously. A clear advantage is the involvement of a well-known energy intermediary who boasts a list of successful projects and features a reputation of integrity and independence. There are, of course also trust-building measures which might be of particular use to the smaller, less known energy intermediary: for example, an earnest and obvious interest in the matters of all actors (to be) involved, a transparent process of defining the objectives and design of a project, open communication channels to and from project stakeholders, and honest articulation of own interests.

Again the Warm Zone project in the British district of Kirklees can serve as practical example of successful networking. As mentioned earlier, this project aimed to bring free cavity wall and loft insulation to all houses within its implementation radius. The Environment Unit of Kirklees Council was initiator of the project and governmental energy intermediary, and together with the en-

ergy utility Scottish Power, it supplied the bulk of the funding (~ £21 million). The Council contacted many other local organisations who might be interested in participation and financing. The power company National Grid supported the development of a business case for the programme. A local insulation contractor was accredited to do all construction work. West Yorkshire Fire and Rescue Services offered a free safety check to interested citizens, including the fitting of smoke and CO alarms. Yorkshire Water provided water conservation advice. Yorkshire Energy Services was entrusted with the implementation and management of the programme, henceforth acting as implementing intermediary. The network of involved organisations also included several other citizen advice services (e.g. benefits or pension advice) and many more (for a full list, see Backhaus 2009). In addition, two funding streams for earlier, quite similar but much smaller initiatives were channelled into the Warm Zone programme.

The interest all actors shared was providing free insulation service and information and advice for a more comfortable, low energy, healthy and safe life at home to all interested and eligible people. Together they were able to generate the required funding, expertise, (will) power and stamina to successfully implement such a programme by bringing together their finances, trained staff, machinery, services, etc. One important aspect for the success of this whole project was the positive reputation of Kirklees Council and other involved community service providers which helped to create trust in this initiative among the population and helped to open doors and ears to energy, water, safety and public services advice and (in many cases) home insulation (Backhaus 2009).

Intermediaries are able to configure and contribute to strategic and well-functioning networks in a variety of ways. Often they have established links they can activate to raise awareness or support for a programme. They can mediate between stakeholders, articulate and translate interests, and ensure that negotiations consider all parties involved (Breukers et al. 2009).

Policy support to meet these practical challenges to intermediary work can take the form of local or regional government representatives becoming part of such networks. Thereby, policy makers can become active participants in DSM instead of delegating responsibility to intermediaries passively. By entering such partnerships policy makers may be able to provide support in terms of finances, contacts, infrastructures, knowledge and more. Thereby, important links and more direct communication to project implementers, (commercial or private) energy end users and other project stakeholders can be established and become important ingredients (i.e. contextual change) of longer-lasting changes. Such project-based networks can even become institutionalised, supporting project implementation over many years and allowing time for behavioural changes to occur and consolidate.

### Tailoring the project to its target group

It is frequently overlooked that DSM programmes need to resonate well with the target group in order to be successful. It is particularly helpful to understand what problems and concerns people have in their current situations and what motivates them to engage in changes. While one target group might be interested in saving money, another may value increased living comfort, and yet another may appreciate better air quality in their hometown. Designing a DSM programme around such motivational drivers increases the likelihood of better reception of and response to the programme (Hermelink 2005). If time and effort are invested in learning about the target group, its behaviour and context(s), the design can be tailored and implementation instruments can profit from improved timing and approach.

An example of the importance of getting to know the target group and tailoring intervention methods to people's needs and concerns provides the Changing Behaviour case study 'The Green Energy Train in The Hague'. The aim of this DSM project was, amongst others, an energy consumption reduction of 5%, based on a behavioural and constructional (i.e. building renovation) approach in almost 230 households of eight apartment blocks. The project failed to achieve its targets due to several reasons. 70% of the tenants have to support renovation plans in order for implementation to proceed. However, opposition to renovation was strong, especially due to a lack of trust in the building management company and a lack of willingness to invest in renovation (i.e. pay higher monthly rent). Eventually, three of the eight buildings agreed to renovation plans, but the chance had been missed to allow for parallel implementation of constructional and behavioural changes. By this time, project implementers had already gone ahead with the dissemination of information material for behavioural change. However, the educational and motivational material provided to all households did not appeal to the target group (Feenstra 2009). Instead of providing clear behavioural guidelines, the communication was grouped in the elements earth, water, fire, air and ether and focused on the development of fresh ideas. Most people considered this too abstract and hardly helpful for their daily life (Breukers 2009).

This project offers some important lessons with respect to early consideration of a target group's needs and its involvement in project design. The energy intermediary could have assessed people's trust in their building management company and their receptiveness to renovation plans earlier. Insights gained could have informed the approach and communication to the target group. Information provided by an independent energy advisory office instead of the building management company may have increased the support of renovation

plans. If the communication material about behavioural changes had been pre-tested, it could have been improved based on people's suggestions, e.g. by focusing on behavioural 'do's and don'ts' or providing tailored advice for each household.

Just as it is important to allow time and budget for learning about the context of a project, it also requires time and money to understand the needs, concerns and motivations of a target group. The importance of making a project relevant to its target group requires policy actors to support such efforts, financially but also in other ways. For example, they should invite project proposals that include measures to learn about the target group as well as flexible project design to accommodate changes triggered by the insights gained.

### Monitoring and evaluating project development

Unfortunately, due to a lack of time and budget, a thorough evaluation of DSM programmes – if planned and undertaken at all – often suffers. However, allocating a certain budget to monitoring an ongoing project and allowing sufficient time to evaluate has several benefits for intermediaries. First, close monitoring reveals early (in)effectiveness of implemented programmes and gives an opportunity to change the approach, e.g. in terms of communication strategies, intervention measures, or stakeholder engagement. Second, direct and regular feedback to the target group, authorities or stakeholders can stimulate further support, and encourage future involvement. Third, evaluation and publication of (tangible) results in terms of achieved energy savings, or target group feedback may help to attain further funding, or financial support in future projects (Mourik et al. 2009b).

A structured approach to monitoring and evaluation hence yields important insights during and after the implementation of a DSM project. At best, the energy intermediary defines success criteria in early developmental stages of such a programme, aiming to reconcile the requirements different stakeholders may have in order to enhance (financial, political, institutional, etc.) support for the project. For example, (a fixed target of) reducing energy consumption, decreasing CO<sub>2</sub> emissions, or increasing knowledge, health or comfort can be set as success criteria. For each criterion, a measurable indicator needs to be defined. For example, reduced energy consumption should be shown on energy bills, or increased knowledge and awareness should be displayed in questionnaires and interviews. Ideally, these indicators are measured several times at different stages during project implementation: prior to any intervention in order to define a baseline; at intermediate stages in order to check whether the project is developing as planned and allow countervailing



unsatisfactory outcomes; and at the end of implementation in order to measure final outcomes.

'The Green Energy Train in The Hague' case study conducted in the framework of the Changing Behaviour project can again serve as an example. As mentioned above, its aim was, amongst others, to reduce energy consumption by 5% following technical changes to the buildings and behavioural changes in tenants. A 'pre-evaluation' of information materials disseminated during this project would have revealed its low appeal to the target group and may have led to adjustments improving its effectiveness. The same conclusion holds for intermediate evaluation, if no pre-testing is done. Intermediate evaluation may still allow sufficient time to adjust information provided to tenants and increase the success of the project. Additionally, the technical set-up of the eight participating multi-apartment blocks did not allow measuring energy consumption for individual flats, but only for each block as a whole. Therefore, the final evaluation could not provide any insights into whether the project had been successful in some households, but not in others, which in turn would have allowed a more detailed analysis. The available aggregated results only showed that the overall 5% energy consumption reduction had not been achieved (Feenstra 2009).

Public policy can contribute to structured evaluation and monitoring by making them strict requirements of funding schemes. Doing so implies gaining some control over project outcomes. However, requirements concerning outcomes are best not to be defined rigidly in terms of energy consumption or CO<sub>2</sub> emission reductions to be achieved. Instead, one should encourage attention to and evaluation of concomitant benefits, such as increased comfort or health, knowledge and awareness, or longer-lasting jobs created. Being strict on conducting evaluations but lenient on the exact criteria to be evaluated provides project implementers with possibilities to develop more tailored DSM programmes and agree upon objectives and evaluation of success criteria flexibly with relevant stakeholders, including policy actors.

Structured monitoring and evaluation is a key to accumulating knowledge of best practices in DSM programmes and enables transfer of such knowledge to intermediaries. Research has shown that intermediaries are willing and interested to learn from others' successes or failures if such knowledge is gathered and disseminated (Changing Behaviour Partners 2009b), as discussed in the following section.

## Learning for now – learning for the future

Learning should occur among all stakeholders involved in DSM programmes. However, the focus of the article at hand as is on energy intermediaries and improving their work. Learning in this context is based on communication, monitoring, evaluation and reflection. It helps to improve understanding of stakeholders' motives and interests, and the effectiveness of intervention measurements or communication strategies.

One of the reasons the above-mentioned 'Green Energy Train' project, for example, fell short of its targets was the information material used. It did not appeal to the target group, and instead of triggering behavioural change, it merely helped to raise some awareness. Simultaneously to the 'Green Energy Train' in The Hague another project using the same material was carried in a neighbourhood of Utrecht, the Netherlands. Neither of the two projects monitored the effectiveness of their intervention method sufficiently. Some adaptations made were hardly communicated to the other project group. Neither of the projects reached its targets and neither triggered noteworthy behavioural change of its target group (Breukers 2009; Feenstra 2009). Had learning about the intervention method and communication material been made an explicit success criterion to be monitored and evaluated throughout the implementation phase of the projects, significant learning effects may have been accomplished. Considering that both projects were running parallel, mutually enhancing learning could have occurred based on frequent communication between project implementers. This may have contributed to a better outcome of both projects, as an early alert to problems with the communication material can lead to improvement and enhanced effects.

An example of more successful learning comes again from the Changing Behaviour pilot project in Latvia which focuses on the renovation of multi-apartment buildings. Based on previous experience, the intermediary organisation managing the pilot knew that support by the building elder is crucial for the success of such a project. During pilot implementation it became clear that the relations between the building elder, the building manager, residents and the intermediary vary in each building and require different strategies for implementation. Frequent reflection on the status quo of the project and adaptive planning towards the desired goal enabled tailored strategies for convincing people to implement the building renovation and energy efficiency measures. In a building with a dominant elder but a rather reluctant building manager, decision-making went fast and the intermediary only had to assist the elder in the technical planning of the renovation. In another building with a cooperative elder and a cooperative building manager, the process developed bottom-

up, with many informative meetings with residents and slow decision-making based on compromises carried by all. In buildings where elders were not supportive, no progress could be made. During the project, Ekodoma, the intermediary implementing the pilot project learned how to understand the different constellations between elders, building managers and residents and how to tailor the approach to support decision-making processes in each case.

Learning about their own context of action and the possibilities for impact enables intermediaries to learn about intervention instruments and their effects, but also to reflect on their position 'in between' other stakeholders and their interests. This in turn can help improve future DSM programmes (Mourik et al. 2009b). In addition, as this article aims to show, a focus on learning about energy intermediaries can strengthen their role as actors of innovation towards an energy transition.

Policy is able to support and strengthen learning processes by allocating budgetary resources to project evaluation and dissemination of results. Additionally, local, regional or (inter-)national events bringing together energy intermediaries and allowing for exchange of experiences can be initiated by public actors. The participants of the four Changing Behaviour workshops consisted of energy intermediaries working in various sectors on a large variety of projects, representatives of local and regional governments, and researchers active in the field. Each workshop proved to be a success due to people's active engagement with its contents and strong motivation to discuss and learn (Changing Behaviour partners 2009b). These events revealed a great need for more networking, dissemination and discussion, which could well be organised by local, regional, or national governments.

## Discussion and conclusions

It has been suggested elsewhere that systemic intermediary organisations can play a 'useful and necessary but not sufficient' role in enabling system transitions (Van Lente et al. 2003). A transition in the sociotechnical system of energy production and consumption is becoming inevitable as its current state cannot be sustained forever. Climate change mitigation calls for fast and far-reaching changes. Technological options, e.g. renewable energy sources, are underway but still face numerous challenges. Social approaches, on the other hand, are readily available, only 'less tangible' and also complex in their realisation. In this article, two issues have been discussed that provide a possible approach to changing people's consumption behaviour: practical and policy support for energy intermediaries. The focus was particularly on energy inter-

mediaries in the context of demand-side management (DSM), who can make important contributions to a transition in energy consumption. While discussion is ongoing, the contribution of DSM programmes in the private sector to reducing energy use and emission but has been found significant (Dietz et al. 2009).

DSM programmes in the 1970s and 80s which were mostly based in the US celebrated only mild successes. The liberalisation of the energy market and a clear policy focus on reducing energy consumption gave – especially in Western European countries – new impetus to the field and opened the stage for a new actor group: DSM energy intermediaries. This group takes over mediating tasks in between a number of stakeholder groups. The value and importance of their work lies in their ability to network between a variety of stakeholders, and to translate and align interests, thereby facilitating the establishment and achievement of common targets. A transition in the system of energy consumption can benefit from intermediary work, as recent successful DSM programmes have demonstrated (Mourik et al. 2009a).

This calls, on the one hand, for practical support of intermediary work. The Changing Behaviour research project developed a number of improvements intermediaries can implement in their daily practice. The well-known 'basics' of good demand-side management programmes include sound funding, strong support and clear targets. Additionally, paying attention to getting to know the target group, establishing a strategic network of stakeholders, monitoring, evaluating and possibly adjusting the DSM programme and learning can help to improve project design and implementation. These and other findings of the Changing Behaviour project will be translated into a number of activities made available as an online toolkit providing practical guidance to DSM intermediaries<sup>7</sup>. An excerpt of these activities for each mechanism discussed in this article to improve DSM projects is shown in Table 1.

Policy makers are able to create favourable conditions for the important work of energy intermediaries. Providing stability and planning reliability with respect to legislation or funding schemes are just as important as allowing for flexibility in the design, monitoring and evaluation of government-funded programmes. When behavioural change is targeted it is important to realise that changes take time. Therefore, it makes sense to orchestrate efforts towards long-term goals, while setting smaller, in-between targets that may be attained within one legislative period (Mourik et al. 2009b). In line with the issues addressed in this article, policy makers should be encouraged to design funding schemes flexibly in order to allow energy intermediaries to design and imple-

<sup>7</sup> The activities will be available via the website [www.energychange.info](http://www.energychange.info).

**Table 1** Overview of some activities developed by the Changing Behaviour project to provide practical support to DSM intermediaries

Mechanism	Activities
Context-tailored project design	Conduct a problem-tree analysis Conduct small-scale research (e.g. interviews, surveys) Balance bottom-up and top-down approaches Analyse opportunities and obstacles in your context
Stakeholder networks based on shared objectives and trust	Identify and engage relevant stakeholders Identify different interests and expectations Develop networks promoting durable change
Tailoring the project to its target group	Pre-test project ideas with (some) target group members Assess the target groups' receptiveness to change Become aware of habits Collect and provide feedback
Monitoring and evaluating project development	Define objectives, success criteria and evaluation indicators Make objectives explicit and share them with stakeholders Evaluate and improve beyond quantitative success criteria
Learning for now – learning for the future	Develop a learning culture Improve your 'know-how' and 'know why' Reflect about your work during project development, implementation and finalisation

ment DSM programmes tailored to their contexts and target groups. Additionally, entering small-scale project or larger-scale programme networks with intermediaries and other stakeholders yields benefits for public policy: active participation instead of passive delegation enables contribution to the design and implementation of such programmes. Important insights for policy development may be gained based on programme evaluation. A bottom-up approach to DSM has advantages with respect to people's receptiveness to information and readiness to engage in behavioural changes. Policy makers can play an important role in the improvement of DSM programmes by stimulating and participating in intermediary-led approaches.

Ideas for public policy to support DSM programmes suggested in this article are extrapolated from the findings about how the ways intermediaries design and implement such programmes can be supported practically. Further research into public policy as a context for DSM can yield better understanding how it can hamper or facilitate different types of energy intermediaries and

DSM projects. A similar project as Changing Behaviour, combining the conceptual work of researchers and practical knowledge of intermediaries but with a focus on policy instead of practical support, could help develop policy mechanisms for more successful DSM support. Just as current DSM projects can benefit from active policy involvement, such a project would rely on active participation of policy makers in research and implementation.

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