Government-affiliated intermediary organisations as actors in system-level transitions

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ABSTRACT

The article draws from two theoretical fields, innovation intermediation and sustainability transitions, to examine the role of government-affiliated intermediary organisations in system-level transitions. The role of intermediaries working between actors – producers and users, entrepreneurs and adopters, idea generators and funders – has seldom been specifically addressed in the transitions literature. Thus, the role of intermediary organisations in enacting change in socio-technical regimes, particularly of intermediaries falling between traditional public sector and private sector actors, is of interest in this article. Empirical analyses of two Finnish organisations, Sitra and Motiva, show that government-affiliated intermediaries are likely to engage in strategic niche management processes in diverse ways, each organisation having its own distinct characteristics. The analysis also points out that to get from niches to transition, sustained systemic intermediaries are crucial in articulating new visions and expectations. Government-affiliated intermediaries may make an important contribution to sustainability transitions by initiating and managing new policy or market processes and by acting as an impartial contact point or voice for new networks of actors. While independence from public administration is likely to facilitate networking, too neutral a stance or limited temporal engagement may reduce the transition-facilitating effects.

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1. Introduction

Interaction, joint activities and problem solving between varieties of actors are crucial to create innovation-facilitating socio-technical transitions towards environmental sustainability. Intermediaries working between actors – producers and users, entrepreneurs and adopters, idea generators and funders – have a role to play in bringing actors together and facilitating joint activities. Indeed, intermediaries have been argued to be frequently engaged in emerging technological and scientific developments (Boon et al., 2011). Yet intermediary organisations as part of sustainability transitions, particularly in the energy regime, have been little studied. Studies of innovation intermediaries have largely focused on agriculture (Klerkx and Leeuwis, 2009; van Lente et al., 2003) and health sectors (Boon et al., 2011) and, even then, rarely from the transitions perspective.

Literature on socio-technical transitions acknowledges that actors and agency are important in the creation of ‘niche innovations’ and regime transitions (e.g. Geels, 2012; Jørgensen, 2012). However, the explicit role of intermediaries working between actors is seldom addressed (cf. Hargreaves et al., 2013). Indeed, van Lente et al. (2003) argue that ‘systemic intermediaries’ are important in long-term and complex changes, including transitions to sustainability. Thus, the potential roles of intermediary organisations in enacting change in socio-technical regimes are of interest. The article draws from two theoretical fields, innovation intermediation and sustainability transitions, to provide novel insights on the role of intermediaries in transitions.

Literature on intermediaries is most established in the context of innovation intermediaries (e.g. Howells, 2006; Klerkx and Leeuwis, 2009; Stewart and Hyysalo, 2008). They have been defined as ‘actors who create spaces and opportunities for appropriation and generation of emerging technical or cultural products by others who might be described as developers and users’ (Stewart and Hyysalo, 2008, p. 296). A range of organisations, such as consultants, brokers, agencies, innovation centres and science parks, and roles have been identified to belong to this group (Bessant and Rush, 1995; Boon...
Intermediaries have been described to range in their reach over the production-supply-use chain (from short to long) and the breadth of content (from thin to fat), the latter referring to the range of products and services (Stewart and Hyysalo, 2008). Due to limited interests of private actors to act as catalysts for sustainability transitions (e.g. Turnheim and Geels, 2012), this article particularly focuses on government-affiliated intermediary organisations, such as quasi-autonomous government agencies, government-owned companies or government-initiated foundations, as they fall between traditional public and private sector actors. They provide an alternative or complement to traditional policy instruments but yet differ from business-based intermediaries, whose actions are typically determined by profit.

Combining the above literatures, the article addresses two research questions: (1) what kind of roles may government-affiliated intermediary organisations take regarding socio-technical transitions, particularly strategic niche management, and (2) what aspects of intermediation appear particularly important for sustainability transitions based on the empirical findings? The article creates a novel analytical framework to examine and compare two government-affiliated intermediaries in Finland, Sitra and Motiva, and their activities regarding energy system transitions. The potential influence of government-affiliated intermediaries on system transitions is more tentatively explored.

The article is organised as follows. Section 2 summarises previous literature on innovation intermediaries, examines transitions literature from an intermediary perspective and presents the analytical framework. Empirical cases and data are presented in Section 3, followed by findings in Section 4. Section 5 discusses the findings and Section 6 concludes the article.

2. Intermediaries and transitions

2.1. Literature on innovation intermediaries

Broadly, literature on intermediaries linked to energy transitions can be grouped into articles dealing with innovation intermediaries (Bessant and Rush, 1995; Boon et al., 2011; Howells, 2006; Klerkx and Leeuwis, 2009; Stewart and Hyysalo, 2008), energy intermediaries (Backhaus, 2010; Hodgson et al., 2009; Roehracher, 2010), and cities as intermediaries in urban transitions (Hodson and Marvin, 2010; Perry and May, 2010). Intermediary organisations’ role in sustainable system transitions has only been identified in a few instances (e.g. Klerkx and Leeuwis, 2009; van Lente et al., 2003).

Innovation intermediaries have been fairly widely discussed in the context of science and technology studies. A variety of activities, or roles, have been identified, that can shortly be grouped into facilitating, configuring and brokering (Stewart and Hyysalo, 2008). The several potential roles of innovation intermediaries include articulation of needs and requirements; identification, generation, combination and dissemination of knowledge; identification, selection, management and allocation of financial and human resources; (neutral) arbitration and brokering; facilitating learning and collaboration within networks of actors; prototyping and piloting; technology assessment and evaluation; accreditation and standard setting; investment appraisal and business planning; and; training, education and communication (Bessant and Rush, 1995; Howells, 2006; Klerkx and Leeuwis, 2009; Stewart and Hyysalo, 2008). Some of these roles relate well to functions and processes identified important for the creation of new niches (Schot and Geels, 2008; van der Laak et al., 2007) or technological innovation systems (Suurs and Hekkert, 2009) supporting transitions, although the connection has not previously been made. Often innovation intermediaries are described as seeking neutrality and credibility in the eyes of those they intermediate between, while there are also issues that may compromise this neutrality (Klerkx and Leeuwis, 2009). Moreover, intermediary organisations have been described as hybrid and boundary crossing (Boon et al., 2011), and, therefore, may have the capability to cross or even destabilise socio-technical regimes. Their temporal extent is rarely discussed.

In the literature review, only four articles were found, in which intermediaries have been explicitly mentioned in connection to socio-technical transitions. van Lente et al. (2003) discuss systemic intermediaries that are important for transitions and differentiate them from more traditional intermediaries. They define systemic intermediaries to have the following roles: demand articulation and strategy development, alignment of actors and possibilities, identification and mobilisation of actors, organising discourse and seeking for consensus, management of complex and long-term innovative projects, creating conditions for learning by doing and using, and feeding actors with tailor-made information (van Lente et al., 2003). Klerkx and Leeuwis (2009) recognise ‘systemic intermediaries for the support of innovation at higher system level’ as one type of innovation broker in Dutch agriculture. Hodgson and Marvin (2010) explicate a need for new intermediary organisations to coordinate urban and socio-technical transitions, and see intermediary organisations set up to intervene in existing systems as a central part of new governance forms. Backhaus (2010) sees the role of intermediaries as bottom–up policy implementers that can also support the establishment of new actor networks and articulation of interests to bring about change. Only van Lente et al. (2003) and, very recently, Hargreaves et al. (2013) address intermediaries in connection to transition theories.

2.2. Intermediaries perspective on transitions research

Studies on sustainability transitions highlight difficulties in destabilising existing, non-sustainable socio-technical systems and in niche innovation breaking into mainstream (e.g. Markard and Truffer, 2006; Raven and Geels, 2010). The extensively developed multi-level perspective, one of the key aspects of transitions research, argues that interplay between three different levels – niche, regime and landscape – is needed (Geels, 2005). Yet it is rather obscure about what concretely needs to happen. A typology of transition pathways (Geels, 2011; Geels and Schot, 2007) somehow concretises transition by listing actors and events but does not recognise intermediaries as among the main actors, though the creation of new networks, often crucial for transition, is certain to require some intermediation. In effect, intermediation potentially contributes to transitions through disturbing existing structures, practices and behaviours from two levels: (1) niche creation and (2) regime (de)stabilisation.

In the multi-level perspective, the emergence of new, alternative niches in ‘protected spaces’ against mainstream selection environments has been viewed necessary to spur changes that would later enable wider systemic transition towards environmental sustainability (e.g. Geels, 2005; Raven, 2006). Although much attention has been paid to niche protection since the late 1990s (Kemp et al., 1998; Markard et al., 2012), the role of intermediaries in niche development has been little studied (Hargreaves et al., 2013). Many studies examining niche-level energy-related processes have shown that boundary-crossing innovative actors, new networks and learning across boundaries are important (e.g. 2 The intermediary nature of organisations varies in that not all activities of a specific organisation necessarily relate to intermediation. Here, intermediary organisations are perceived as organisations having a high focus on and/or high proportion of activities related to intermediation.
Table 1

Niche internal processes and related hypotheses presented in literature (based on Schot and Geels, 2008; van der Laak et al., 2007, and modified from Lovio and Kivimaa, 2012).

<table>
<thead>
<tr>
<th>Internal processes</th>
<th>Description</th>
<th>Hypotheses for successful niche building</th>
</tr>
</thead>
<tbody>
<tr>
<td>The articulation of expectations and visions</td>
<td>Crucial for niche development because of providing direction to learning and exploration, attracting attention, and legitimating shielding and nurturing.</td>
<td>Expectations are shared by many actors, they are specific enough to give guidance, and their content is substantiated by on-going projects.</td>
</tr>
<tr>
<td>The building of social networks</td>
<td>Creates a constituency behind a new technology (or a socio-technical path), facilitates interactions between relevant stakeholders, and provides necessary resources (money, people, expertise).</td>
<td>Networks are broad (multiple kinds of stakeholders are included) and deep (participants are able to mobilise commitment and resources within their own organisations), and alignment within the network is facilitated through regular interactions between the actors.</td>
</tr>
<tr>
<td>Learning (and exploration) processes at multiple dimensions</td>
<td>Technical aspects, market and user preferences, cultural meaning, infrastructure, production networks, regulations, and societal and environmental effects.</td>
<td>Learning processes include first-order learning (accumulation of facts and data) and reflexive second-order learning (enabling changes in frames and assumptions), and are broad focusing on technological, economic and social aspects.</td>
</tr>
</tbody>
</table>

Garud and Karnøe, 2003; Raven and Verbon, 2007), while they do not provide enough information on how to achieve these. Therefore, this article addresses this gap by examining through which activities intermediary organisations can facilitate niche development.

In addition, this article pays attention to the stability versus destabilisation of regimes. Turnheim and Geels (2012, p. 35) have introduced the concept of socio-technical regime destabilisation as “weakening reproduction of core regime elements”, and describe destabilisation occurring through actors reorienting themselves to a new regime or through new actors replacing incumbent actors and introducing a new regime. Intermediaries may attempt to destabilise dominant regimes, for example, by aiming to decrease public legitimacy for and endogenous commitment to an existing regime, or unintentionally disrupt existing structures (cf. Klerkx and Leeuwis, 2009). More traditional intermediaries may, rather, contribute to the stability of regimes (van Lente et al., 2003). For example, state support may induce the formalisation of networks to existing rules and practices (Laschewski et al., 2002). Thus, the potential role of intermediaries in regime destabilisation merits more attention. It is in this article addressed mainly in connection to niche management, as the slow expansion of low carbon niches is argued to require speeding up by deliberate destabilisation of fossil fuel based industries (Turnheim and Geels, 2012).

Smith and Raven (2012) describe three properties of niche protection that contribute to wider transition processes: shielding, nurturing and empowerment. While shielding, defined as “processes holding at bay certain selection pressures from mainstream selection environments” (Smith and Raven, 2012, p. 1027), includes many traditional policy instruments, such as specific R&D programmes for alternative technologies and subsidies supporting their adoption, nurturing is difficult to cover merely through traditional policy. Thus, the article explores whether government-affiliated intermediaries could support nurturing, defined by Smith and Raven (2012, p. 1027) as processes supporting path-breaking innovation, for example, similarly to Strategic Niche Management (Schot and Geels, 2008) or Technological Innovation Systems (Suurs and Hekkert, 2009).

2.3. Analytical framework

According to Kemp et al. (1998, p. 185) Strategic Niche Management emerged “as a possible strategy for governments to manage the transition process to a different regime”. The approach groups niche internal processes into three categories: articulation of expectations and visions, building of social networks and learning processes (Table 1) (Schot and Geels, 2008; van der Laak et al., 2007). Niches are perceived to stimulate regime-level changes “if visions become more precise and more broadly accepted, if the alignment of various learning processes results in a stable configuration, and if social networks become bigger…” (Geels, 2012, p. 2). The three processes are here taken as ones in which intermediary organisations could have a role. Learning is particularly seen as exploration for social and technological innovation and diffusion (cf. Hyysalo, 2009).

The framework for analysis (Table 2) is created by combining previous intermediary literature, reviewed in Section 2.1, with niche internal processes (Table 1). The article through this analytical framework particularly contributes to Strategic Niche Management theory: it addresses the theory’s lack of attention to the role of intermediaries and it also adds details on the activities under the niche internal processes. The analytical framework combines the concepts of niche internal processes with specific activities by creating a typology of intermediary roles as groupings of those presented in literature. While the roles originate from intermediary literature, they also generally concretise the activities under niche internal processes. An additional category ‘other’ is created to include those roles described in the literature that do not fit under any of the niche internal processes. Roles under ‘the articulation of expectations and visions’, specifically A1, A2 and A4, can be broader than mere niche management and incorporate efforts to destabilise dominant regimes. Contrarily, roles under ‘other’ may diver from specific niche support (O1) or sometimes even support existing regimes (O3). The framework is applied to both technical and non-technical innovation activities.3

3. Research approach

3.1. Empirical focus

The analytical framework was tested in the context of two national-level intermediaries who carry out activities related to energy production and use. The intermediaries operate in the Finnish energy regime, characterised by a large variety of energy sources used; bioenergy as the largest domestic energy source; industry as a significant energy user (46% of total consumption in 2011) followed by transport (24%) and heating of buildings (17%); and the prevalence of largish distributed energy generation in connection to industrial plants and district heating. The Ministry of

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3 Though specific references to technology are made as specific roles emerging from intermediary literature (A3, L2), generally roles, e.g. new network creation or knowledge processing, can be equally related to technical, service or policy innovation.
Employment and Economy is in charge of energy policy that is increasingly focused on renewable energy. The Ministry of the Environment deals with the energy efficiency of buildings.

The energy regime is increasingly influenced by EU policy and climate change concerns (Kivimaa and Mickwitz, 2011). Despite EU influence, power in Finnish energy policy has remained with the above ministries, the Ministry of Finance, large energy producing companies, the Confederation of Finnish Industries and the Technical Research Centre of Finland (VTT) (Ruostetsaari, 2010). The energy intermediary network in Finland is ‘somewhat sparse and patchy’ and, while few regional energy agencies exist, no systematic network of local energy or advisory agencies exists (Hodson et al., 2009). The two case organisations Motiva and Sitra, not identified by Ruostetsaari (2010) among the power elite, present Finland’s key energy-related, government-affiliated intermediaries. In addition, eight regional/municipal energy agencies with varying operational areas and funding sources exist. The energy regime involves also an innovation-focused intermediary, Tekes – the Finnish Funding Agency for Technology and Innovation.

Motiva and Sitra were selected as the empirical cases, because their positioning in the energy system gives them in principle good possibilities to intermediate between various energy system actors, while the article seeks to discover the diversity of ways in which this intermediation occurs. Motiva is an expert company promoting efficient and sustainable use of energy and materials. It was established in 1993 and, in 2000, it became a limited company. Motiva’s whole share stock is owned and most of its services are bought by the government. Its services are utilised by the public administration, businesses, communities, and consumers. Motiva has 57 employees working in the field of energy and material efficiency. It has been described as a critical energy intermediary and a key implementer of energy efficiency policy in Finland (Hodson et al., 2009).

Sitra is based on endowment capital and return on investments (not on government budget). Sitra carries out a range of activities. Its energy related tasks were done on a temporary basis through an energy programme ran between 2008 and 2012. Sitra has circa 100 employees of which ten worked specifically in the programme. During 2008–2011, under the Energy Programme, Sitra spent over 8 million euros on projects and made 7.5 million euro investments in five emerging businesses (Sitra, 2010, 2012).

3.2. Research methods and material

Intermediary activities were explored through interviews and mapping the case organisations’ project portfolios. The empirical material comprised interviews of ten employees of and six stakeholders to the organisations (Appendix), printed or electronic publications (15) and websites for projects and news releases by the case organisations (77). Five people working in each case organisation, selected to represent different types of energy-related activities and based on suggestions by early interviewees, were interviewed between September 2011 and January 2012 using a similar thematic structure (Appendix). The interviewees’ expertise covered broadly the projects/activities identified in the document analysis. In addition, perceptions of five stakeholders per case organisation – selected to represent different types of organisations and mixed knowledge of both prevalent and experimental activities – were gained through interviews conducted between June and October 2012. Stakeholders’ views typically arose from interaction in a particular project/activity, rather than representing a complete picture of the organisations. Sitra’s stakeholder interviews focused on energy advice, wider programme activities, funding and gatekeeper projects. They did not cover construction and land-use planning or include the recipients of venture capital. Motiva’s stakeholder interviews covered energy efficiency, energy advice and sustainable public procurement, representing public administration and consultancy but not industry or the general public. Interview transcripts were coded in NVivo using the roles

Table 2
A typology of intermediary roles as contributors to niche internal processes.

<table>
<thead>
<tr>
<th>Articulation of expectations and visions</th>
<th>Building of social networks</th>
<th>Learning processes and exploration at multiple dimensions</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Articulation of needs, expectations and requirements (A1) 2,4,5,8</td>
<td>• Creation and facilitation of new networks (N1) 2,4,5,6,8</td>
<td>• Knowledge gathering, processing, generation and combination (L1) 3,6,8</td>
<td>• Arbitration based on neutrality and trust (O1) 9</td>
</tr>
<tr>
<td>• Strategy development (A2) 2,5</td>
<td>• Gatekeeping and brokering (N2) 2,4,5,8</td>
<td>• Technology assessment and evaluation (L2) 1</td>
<td>• [Long-term] project design, management and evaluation (O2) 2,3,6,9</td>
</tr>
<tr>
<td>• Acceleration of the application and commercialisation of new technologies (A3) 4,5,8</td>
<td>• Configuring and aligning interests (N3) 2,4,5,6,8</td>
<td>• Prototyping and piloting (L3) 3,4,6,8</td>
<td>• Policy implementation (O3) 1,9</td>
</tr>
<tr>
<td>• Advancement of sustainability aims (A4) 6,7</td>
<td>• Managing financial resources – finding potential funding and funding activities (N4) 1,3,4,6,8</td>
<td>• Investments in new businesses (L4) 1</td>
<td>• Accreditation and standard setting (O4) 8,9</td>
</tr>
<tr>
<td></td>
<td>• Identification and management of human resource needs (skills) (N5) 1,3,4,6,8</td>
<td>• Communication and dissemination of knowledge (L5) 2,4,5,6,8</td>
<td>• Creating new jobs (O5) 10</td>
</tr>
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<td></td>
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</tbody>
</table>

2 van Lente et al. (2003).
3 Howells (2006).
4 Klerkx and Leeuwis (2009).
5 Boon et al. (2011).
6 Hodson and Marvin (2010).
7 Rochracher (2009).
8 Stewart and Hyysalo (2008).
9 Backhaus (2010).
10 Hodson et al. (2009).

* ‘Building of social networks’ is here interpreted as promoting a particular niche and, therefore, arbitration based on neutrality is addressed under the category ‘other’.

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* ‘Building of social networks’ is here interpreted as promoting a particular niche and, therefore, arbitration based on neutrality is addressed under the category ‘other’. 
Table 3
Summary of Sitra and Motiva intermediary roles based on internal interview quotes, external interview quotes and project mapping (latter two in brackets). The interpretation of the strength (bolded) is based on how many interviews brought related issues up and how they described it. Where the analyses of project mapping and external interviews differ from internal interviews, this is expressed in brackets.1

<table>
<thead>
<tr>
<th>Intermediary roles</th>
<th>Sitra</th>
<th>Motiva</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articulation of expectations and visions</td>
<td>Fairly strong” (4 visible projects, frequent stakeholder observations, strong”)</td>
<td>Medium (1 visible activity, 1 stakeholder observation, fairly weak)</td>
</tr>
<tr>
<td>Articulation of needs, expectations and</td>
<td>Medium (built environment strategy creation and regulation renewal, stakeholder observations)</td>
<td>Absent</td>
</tr>
<tr>
<td>requirements (A1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategy development (A2)</td>
<td>Medium (1 large and 1 small project, 1 stakeholder observation)</td>
<td>Fairly strong” (1 activity, no stakeholder observation, weak)</td>
</tr>
<tr>
<td>Acceleration of the application and</td>
<td>Strong” (frequently in projects, stakeholder observations)</td>
<td>Strong” (3 visible and 1 other activity, stakeholder observations)</td>
</tr>
<tr>
<td>commercialisation of new technologies (A3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advancement of sustainability aims (A4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building of social networks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creation and facilitation of new networks (N1)</td>
<td>Strong” (a large project and business investment, stakeholder observations, medium)</td>
<td>Strong” (frequently in activities but no stakeholder observations, medium)</td>
</tr>
<tr>
<td>Gatekeeping and brokering (N2)</td>
<td>Medium (built environment strategy, energy advice system and one other project, 1 stakeholder observation)</td>
<td>Fairly strong” (frequently in activities, stakeholder observations)</td>
</tr>
<tr>
<td>Configuring and aligning interests (N3)</td>
<td>Strong” (one visible project, stakeholder observations, medium)</td>
<td>Medium (2 visible activities but no stakeholder observations)</td>
</tr>
<tr>
<td>Managing financial resources – finding</td>
<td>Strong” (all projects, frequent stakeholder observations)</td>
<td>Fairly weak (absent)</td>
</tr>
<tr>
<td>potential funding and funding activities (N4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identification and management of</td>
<td>Absent (three projects but no stakeholder observations, medium)</td>
<td>Absent</td>
</tr>
<tr>
<td>human resource needs (skills) (N5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning processes and exploration at multiple</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dimensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge gathering, processing, generation</td>
<td>Strong” (several large and smaller projects, stakeholder observations)</td>
<td>Strong” (frequently in activities, stakeholder observations)</td>
</tr>
<tr>
<td>and combination (L1)</td>
<td>Weak (absent)</td>
<td>Weak (absent)</td>
</tr>
<tr>
<td>Technology assessment and evaluation (L2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prototyping and piloting (L3)</td>
<td>Strong” (two visible projects, frequent stakeholder observations)</td>
<td>Absent</td>
</tr>
<tr>
<td>Investments in new businesses (L4)</td>
<td>Fairly strong” (investment in new business and energy investment portfolio but no stakeholder observations)</td>
<td>Absent</td>
</tr>
<tr>
<td>Communication and dissemination of knowledge (L5)</td>
<td>Strong” (two visible and three smaller projects, stakeholder observations)</td>
<td>Strong” (nearly all activities, stakeholder observations)</td>
</tr>
<tr>
<td>Education and training (L6)</td>
<td>Absent (three projects, stakeholder observations)</td>
<td>Medium (3 activities, stakeholder observations)</td>
</tr>
<tr>
<td>Provision of advice and support (L7)</td>
<td></td>
<td>Strong” (frequently in activities, stakeholder observations)</td>
</tr>
<tr>
<td>Creating conditions for learning by doing and</td>
<td>Fairly strong” (1 large and 1 small project, stakeholder observations, medium)</td>
<td>Weak (absent)</td>
</tr>
<tr>
<td>using (L8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other roles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arbitration based on neutrality and trust (O1)</td>
<td>Fairly strong” (absent)</td>
<td>Fairly strong” (no mention in projects, stakeholder observations, weak)</td>
</tr>
<tr>
<td>(Long-term) project design, management and</td>
<td>Weak (one project, implicit in stakeholder observations)</td>
<td>Medium (2 visible activities but no stakeholder observations)</td>
</tr>
<tr>
<td>evaluation (O2)</td>
<td>Absent (one project, weak)</td>
<td>Strong” (2 visible activities, frequent stakeholder observations)</td>
</tr>
<tr>
<td>Policy implementation (O3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accreditation and standard setting (O4)</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Creating new jobs (D5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Example quotes for each role are provided in the electronic supplementary data to this article.

Presented in Table 2, while these roles functioned as primary analytical tools for the NVivo analysis, new codes were added to NVivo, when interviewees mentioned activities that did not fit under any of the pre-determined roles. In total 14 codes emerged during transcript reading of which 8 appeared in more than one source.4 Interpretation of findings was carried out on the basis of interviews and the strength of each role (shown in Table 3) was determined on the basis of how many interviewees brought up the issue and how they described it.

The documentation used to map case organisations’ project portfolios included nearly 100 sources, such as annual reports, stakeholder journals, project reports, and websites collected from the interviewees and the case organisations’ websites. In the case of Motiva, 28 activities/projects were coded (of which 10 were energy efficiency agreements for different sectors), leaving participation to international projects outside the analysis. In the case of Sitra, 34 activities/projects were coded. The selection was limited to projects/activities that were in operation in 2010 and/or 2011. In project portfolio analysis, recorded roles were based on specific references to the case organisations’ tasks in the document sources studied. The interpretation of the documented project/activity was made in Excel by two researchers independently. The prevalence of each role was determined by the number of projects/activities that was assessed to fulfil that role, the numbers ranging from zero to 23 for Sitra and 16 for Motiva. Based on the prevalence, the roles were divided into six groups: strong, fairly strong, medium, fairly weak, weak and absent and compared to a similar analysis of the interview quotes. Potential system impact was analysed by examining interview quotes, document statements and the range of

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4 Ten of these codes were akin to roles, whereas others were more general codes to take note of potentially interesting issues, such as “impacts of intermediation” and “links to existing system”.

undertaken projects from the perspective of intentions, connection to existing regimes, and niche-creation activities.

4. Empirical results: Sitra and Motiva

4.1. Sitra

4.1.1. Internal interviews

Sitra takes on a wide variety of intermediary roles related to all three niche internal processes. The only roles it does not engage in are identification of human resource needs (N5), education and training (L6), and policy implementation (O3). While Sitra does not train people as such, it participated in a project training people as gatekeepers. Apart from business funding covering also renewable energy, the activities focused on energy use in the built environment. Thus, Sitra could be described as an intermediary with a wide range of different roles but not encompassing the whole energy system (i.e. largely excluding resource and production sides). It could be viewed, according to Stewart and Hyyssalo (2008) definition, a ‘short and fat’ intermediary.

4.1.1.1. Articulation of expectations and visions. Three out of five interviewees brought up the role of articulating (A1) important issues and taking these forward. The issues articulated include the importance of energy saving in communities and how building regulation could be significantly changed to achieve energy saving. According to two interviewees, Sitra has taken part in strategy development (A2) with the Ministry of the Environment regarding built environment and construction through participation in the creation of new building regulations and ERA17 Programme. According to two interviews, Sitra’s activities try to accelerate the application of new technologies (A3) by utilising new (solar) technologies in pilot projects, creating markets for new technologies in energy efficiency, and funding new businesses in the field of renewable energy and energy efficiency. In the speech of all interviewees, sustainability aims (A4) were present through attempts to reduce CO₂ emissions and improve energy saving and renewable energy use. Overall, the interviews gave an impression that the articulation of expectations and visions, in combination with activities aiming to realise these visions, is an important part of the Energy Programme.

4.1.1.2. Building of social networks. While it was clear in all interviews that Sitra cooperates with many actors, the creation and facilitation of new networks (N1) was somewhat implicit. References to activities related to gatekeeping and brokering (N2) could only be found from two interviews. They related to Sitra’s intermediary role between the public and private sectors, and cooperation with and perspectives on the activities of both. Also, in the Peloton Campaign, Sitra could offer the main organiser contacts and a name for negotiation with business partners who could take on an innovative approach of ‘gatekeepers’. In funding businesses, Sitra has given companies market information, contacts and leads on possibilities. Configuring and aligning interests (N3) was reflected in four interviews. It was seen that project partners needed motivation to see their benefit in the activity. Regarding business funding, Sitra engages in configuring the activities in dialogue with the funded company. Sitra has also helped different Tampere city departments to fruitfully interact and to connect their activities to other activities of the Energy Programme. In creating the energy advice system, Sitra has connected similar local ideas together. In all interviews, it became clear that finding potential funding activities (N4) and managing them was a clear intermediary role. Sitra has sought to fund a range of activities from investment funds related to renewable energy, through innovative start-ups focused on sustainable energy production and use, to background studies, pilot projects and energy advice experiments supporting Sitra’s systemic goals.

4.1.1.3. Learning processes and exploration. In all interviews, activities related to knowledge gathering, processing, generation and combination (L1) were clearly visible. Knowledge was collected in different ways – background studies, pilot projects, competitions, international visits, technology tests, investments in business funds, and workshops – and processed differently in different projects. The interviewees referred, for example, to “background studies that have been needed to realise legislative change”, “researching whether solar energy can be used in warming water connected to a district heating network”, and “calculating alternative land use models, energy production options, building energy-efficiency solutions and searching how land use planning could take into account these”.

The role of technology assessment (L2) was explicit in only one interview comment related to testing of heat pumps in different conditions. Yet, it is probably a part of many projects, for example, developing the use of solar heating in residential areas. Still, Sitra does not take part in official technology assessment. In contrast, prototyping and piloting (L3) was brought up in several instances by four interviewees. The aim of piloting is to show that the ideas Sitra talks about can work in practice and to produce information for future activity of kind. Examples brought up included developing a new residential city block, developing residential heating and land use planning in a smaller town context, pilot constructions of zero energy buildings, and development of heat pump testing activity. Also investment in new, starting and innovative businesses (L4) portrayed as a significant role. Interestingly the impact of these investments was described differently by one interviewee compared to another. While one interviewee described a significant example and visibility impact of business investments, another interviewee stated that the investment impacts, particularly market impacts, are small. All interviewees mentioned activities directly related to communication and dissemination of knowledge (L5), for example, in the form of guidebooks and manuals and informational instruments for planning renovation of buildings. Dissemination has also occurred through participation in project steering groups. Also, in start-up business funding, Sitra has provided guidance and information leads. Provision of advice and support (L7) was not as a prevalent activity as many others under this category (Table 3). However, three interviewees mentioned such examples as advice and support to those companies that are invested in, to Demos Helsinki who was leading the Peloton Campaign and on how land use planning could incorporate energy efficiency and emission components. The ways in which Sitra creates conditions for learning by doing and using (L8) were rather implicit. Examples included competitions organised by Sitra to generate propositions, and technical examples on how construction and renovation could promote energy efficiency. Sitra has also played a part in encouraging ‘gatekeepers’ in different professional groups to act on climate change issues and realise their ideas in

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4. An interviewee explained processes in which different funded activities began to form connections to one another (e.g. the energy envoy connected activities in different towns). Another interviewee explained how Sitra selected focus areas, where existing actors are few. A third told about innovation camps, in which new networks were formed.

6. “A beginning, concrete project is an energy renovation competition, where four small houses from a certain period are concretely renovated. (In the project,) it is said that you need to half the energy consumption, and it needs to be done economically…”.
practice. In effect, one of the interviewees described Sitra as an ‘enabler organisation’.

4.1.1.4. Other roles. In three interviews arbitration based on neutrality and trust (O1) was seen as part of Sitra in a way that it is ‘financially independent’, ‘politically neutral’ and not reliant on other organisations. Yet, simultaneously it does have a point of view on energy saving, which it promotes ‘based on facts and neutrality’. Project management, design and evaluation (O2) was explicitly mentioned by only one interviewee, although the energy programme is organised through a variety of projects. In many projects, Sitra is not the manager but rather a supporter and coordinator. While policy implementation (O3) was not Sitra’s role, the interviews revealed a new intermediary role – policy or regime renewal. According to three interviews, Sitra has formally and actively participated in policy programme and regulation renewal processes on a national level regarding built environment energy use. Examples were also presented regarding Sitra’s activities in influencing municipalities to integrate emission reductions in all departmental decision-making and to renew land use planning. Other emerging definitions of Sitra include ‘a temporary transitional actor’, an ‘initiator’ of new things and a ‘change facilitator’ but, when the activity is on-going, Sitra detaches itself from it.7

One interviewee also viewed that Sitra specifically aims to promote systemic and structural change on issues it identifies as important.

4.1.2. Project portfolio and stakeholder interview analyses

Sitra has taken part in a range of projects with a focus to improve built environment energy use through a variety of tools: investments in new businesses (L4), and piloting alternative ways of construction and renovation and of planning and building residential areas (L3). The idea has also been to encourage others – from consumers to businesses – to take on active roles in achieving systemic change. In some projects, Sitra’s role has been confined to that of a funder (N4) but, in others, it has been active in gathering, processing, generating (L1) and communicating knowledge (L5), articulating new options in how policy and markets in built environment energy use could be operated (A1), and providing advice (L7) for other actors engaged in these projects. While Sitra’s roles in the projects have been more limited, the projects themselves have covered nearly all roles apart from neutral arbitration (O1), accreditation and standard setting (O4), and creation of new jobs (O5) – covering all aspects of strategic niche management in the field of built environment energy use. The target groups and partners of projects have included public authorities, municipalities, citizens, urban planners, construction companies, renovation architects, builders, building owners, housing companies, maintenance companies, energy companies, research organisations, educational organisations, shopkeepers, and restaurant workers.

In stakeholder interviews, all roles related to articulation of visions and expectations were present (A1–A4) quite similarly to internal interviews. The articulation of needs and expectations (A1) was highlighted, Sitra identified as bringing up new discourses and ways of thinking, opening up new issues, challenging old structures and creating market disturbance – representing specific attempts for regime destabilisation. In building of social networks, stakeholder interviews reflected roles similarly to internal interviews but differed in many places from the project portfolio analysis.8

4.1.3. Potential links to system change

Going beyond niche management, Sitra tries to influence system-level transitions more broadly. Sitra has frequently defined itself as an actor promoting systemic change. The annual report of 2010 states that “During the year Sitra continued its independent and active operation . . . as an accelerator of systemic change” and “Sitra’s Energy Programme cooperated with the Ministry of the Environment also in renewing building regulations. Going from building part specific energy efficiency steering to calculating building total energy is a significant systemic change that will promote innovations” (Sitra, 2011, p. 6, 12). The same goal was also present in interviews: “In our programme, we have sought the systemic change of redevelopment building and it has been extremely successful. We have also tried to seek for systemic change in reconstruction”. Sitra appears to represent an intermediary promoting both regime destabilisation through its activities aiming for legislative and market changes in regimes, in which it is not a fixed actor, and niche development for low or zero energy housing and land use planning – but with a limited engagement period. It is too early to see the final outcomes of the programme activities but intermediate outcomes can be observed as new policy programmes, regulations, business models, and small scale practices.

4.2. Motiva

4.2.1. Internal interviews

The interviews reveal that Motiva cooperates with and aims to influence a variety of actors from school children to industry. Motiva particularly takes on intermediary roles related to building of social networks and learning processes. However, in all categories there are several roles Motiva does not engage in, including strategy development (A2), identification of human resource needs (N5), prototyping and piloting (L3), investments in new businesses (L4), accreditation and standard setting (O4) and creating jobs (O5). By contrast, roles related to policy implementation and evaluations are particularly prevalent. Thus, Motiva could be described as an intermediary dealing with energy production and use (but not resources) with multiple stakeholders and sectors, a longish and ‘chubby’ intermediary.

4.2.1.1. Articulation of expectations and visions. The articulation of needs, expectations and requirements (A1) did not come across widely in the interviews but some references were made: ‘one important role we have, independent of field and sector, is this identified in connection to three fairly significant projects/activities. ‘Configuring and aligning interests’ (N3) was mentioned frequently by stakeholders but was only linked to one project/activity.

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7 According to interviews, Sitra is never a permanent owner in companies. The ownership in start-up business is longer than the Energy Programme 5-year time period, even exceeding 10 years. Sitra actively seeks to find actors that continue activities that Sitra leaves.

8 Stakeholders mentioned little or not at all roles ‘gatekeeping and brokering ‘identification and management of human resource needs’ (N5), while they were funding activities (N4) and the creation of new networks (N1) were the most frequent roles, the latter described as networking, finding new actors and creating architecture for the energy advice system. In learning processes, differences were only noted against project portfolio analysis regarding piloting (L3) and business investment (L4). Sitra’s role in prototyping and piloting (L3) was emphasised through new business models, action models and user-oriented development. Other roles did not come up. Contrarily to internal interviews, stakeholders did not acknowledge Sitra’s investments in new businesses, probably because the interviewees did not include start-up businesses. One interviewee raised concerns about the continuation of activities initiated by Sitra: “Particularly the examination of bigger pictures and of new ways of acting and speaking are things, whose continuation is worrying . . . the kind of broadmindedness in searching and finding actors is a thing, that I am not sure who else could do it”.

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A1 2010–2011. Sitra’s Energy Programme cooperated with the Ministry of the Environment also in renewing building regulations. Going from building part specific energy efficiency steering to calculating building total energy is a significant systemic change that will promote innovations” (Sitra, 2011, p. 6, 12). The same goal was also present in interviews: “In our programme, we have sought the systemic change of redevelopment building and it has been extremely successful. We have also tried to seek for systemic change in reconstruction”. Sitra appears to represent an intermediary promoting both regime destabilisation through its activities aiming for legislative and market changes in regimes, in which it is not a fixed actor, and niche development for low or zero energy housing and land use planning – but with a limited engagement period. It is too early to see the final outcomes of the programme activities but intermediate outcomes can be observed as new policy programmes, regulations, business models, and small scale practices.

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attitude-shaper-role". In addition, as an intermediary between the ministries and companies, Motiva articulates ideas to both directions: "...in the role of a message broker, both from the field to the ministry and from the ministry to the field, and in that Motiva is in a way a nodal point that then refines these thoughts to both directions." In three out of four interviews, the acceleration of the applications and commercialisation of new technologies (A3) was brought up. Motiva has had several projects in which one of the ways to improve energy efficiency is to test new operational methods and equipment and, by communicating the test results, to promote the take up and diffusion of better technology. Example technologies include LED lighting and heat pump applications in industry. Sustainability aims (A4) were present in all interviews, in that Motiva’s starting point for activities is improving energy and material efficiency.

4.2.1.4. Other roles. Three interviews brought frequently up the role of Motiva in arbitration based on neutrality and trust (O1). The employees saw Motiva as impartial and neutral in that it would not favour particular technologies, such as district heating over heat pumps, or specific companies. They saw the fact that Motiva employees are not government officials as a factor increasing their role as an impartial actor in cooperation with companies. However, they do take a stand that energy should not be wasted and that the use of renewable energy is smart. Project design, management and evaluation (O2) was mentioned by three interviews with a particular focus on evaluation. All interviews mentioned examples related to policy implementation (O3), such as the coordination of energy audits in municipalities and energy efficiency agreements in industry, agriculture and transport but also the implementation of the national climate and energy strategy more generally. Additional roles that emerged from interview data included ‘representing Finland in the EU in preparation of new policies’, ‘shaping attitudes’, ‘creating political will’, and ‘quality control of audits’.

4.2.2. Project portfolio and stakeholder interview analyses

Motiva’s projects deal with several target groups from businesses to consumers, private to public sector, and employees to management. The operation is largely focused on reducing energy use and making it more efficient, while a few activities also aim to increase the production of renewable energy by municipalities and households (A4). The sectors covered include farming, buildings and construction, transport, public procurement, heating, and the service sector.

An analysis of circa 30 activities of Motiva shows, similarly to interviews, that the activities Motiva intermediates relate to several different roles. Completely absent were only four roles: strategy development (A2), identification and management of human resources (N5), investing in new businesses (L4) and creating jobs (O5). However, in some roles Motiva’s part remained rather uncertain as the projects were described in passive tense or some other party had been assigned the responsibility. These include acceleration of the application of new technologies (A3), managing financial resources (N4), technology assessment and evaluation (L2), and prototyping and piloting (L3). Thus, it is likely that Motiva itself does not carry out these roles but rather coordinates projects in which others undertake these activities. Based on project portfolio analysis, Motiva takes a strong role in knowledge communication (L5), knowledge gathering and processing (L1), gatekeeping and brokering (N2), and provision of advice and support (L7) – largely activities dealing with learning processes. Yet, it is also clear that the promotion of sustainability aims (A4), particularly those defined in government policy, is a strong force behind the activities.

Even more strongly than project portfolio analysis, the stakeholder interviews emphasise Motiva’s role principally as facilitating learning processes. Only once did interviews bring up issues related to articulation of visions, although the energy efficiency efforts of Motiva were much emphasised (A4). The stakeholders placed most emphasis on Motiva as a policy implementer (O3), following the requests and set targets of the ministries. In addition, explicit roles included collection (L1) and communication of knowledge (L5), training (L6), advice (L7), gatekeeping and brokering (N2), and neutral arbitration (O1). While the interviewees saw several benefits in Motiva’s actions, particularly through Motiva’s wide communications expertise, also critique was presented due to its financial dependence on the Ministry of Employment and Economy, focus on single technologies or issues at a time, and use of fairly traditional information or practices: "Someone needs to order something from Motiva, for it to do things. Motiva’s interventions often focus on only a single user group, theme or technology that generally some client – typically a ministry – has defined." Based on
4.2.3. Potential links to system change

Aside niche management, many Motiva’s activities deal with the implementation of existing policies rather than destabilising the institutional regime. It has no explicit transition aims. Motiva is linked to existing regimes for energy and transport, not as tightly as official government agencies but as a permanent actor. It aims to increase awareness and accelerate the application of new concepts and technologies, contributing to change through bottom-up, from the transitions perspective, fairly incremental and late measures. Therefore, Motiva is unlikely to engage in early niche creation but possibly in niche diffusion. Two interviewees actually state that Motiva promotes relatively new functioning practices that are already commercially available, while Sitra is freer to develop and fund new systems.

5. Findings and discussion

5.1. Summary of findings

The empirical data reveals similarities and differences between the two organisations: Motiva, a government-owned company promoting efficient use of energy and resources, and Sitra, a foundation to promote sustainable well-being in Finland. The similarities relate to a strong role given in internal interviews to sustainability aims (A4) and, in that context, neutral arbitration (O1) and creation of new networks (N1). Moreover, knowledge gathering, processing, generation and combination (L1) and disseminating that knowledge (L5) were significant activities. While both take on roles under the three Strategic Niche Management categories, the strengths of these roles differ between the organisations, Sitra having a wider scale. As shown in Table 3, Sitra portrays strong activity in articulating needs, expectations and requirements for the society (A1), finding potential funding activities (N4), prototyping and piloting (L3), investing in new businesses (L4) and creating conditions for learning by doing and using (L8) – most of these being in a relatively small role or absent for Motiva. Configuring and aligning interests (N2) was highlighted in interviews but was less explicit in project documentation, probably due to the nature of the activity. Motiva, by contrast, is focused on gate-keeping and brokering (N2), provision of advice and support (L7), and policy implementation (O3). In addition, technology acceleration (A3) was present in internal interviews. Overall, the case organisations have rather complementary roles with each other in the sustainability advancement of the Finnish energy regime, while some intermediary roles are still completely absent. These include the identification and management of human resource needs (N5), accreditation and standard setting (O4) and creating new jobs (O5). One question is, who takes over those roles that appear absent in Motiva’s activities at the end of Sitra’s Energy Programme.

In both cases roles emerged that were not part of the SNM-framework and did not fit the innovation intermediary categories, i.e. the empirics were broader. Additional roles that government-affiliated intermediaries may take in connection to sustainability transitions include policy or regime renewal, opinion influencer or a change initiator on a wider sense, but it is only certain kinds of intermediaries that are able to take on these ‘systemic’ (cf. Hodson et al., 2009) or ‘empowering’ (cf. Smith and Raven, 2012) roles. More tangible additional roles were related to quality control and EU representation. Based on previous categorisations of energy intermediaries (Hodson et al., 2009; Rochracher, 2009), both Motiva and Sitra can be described as policy-driven but only Sitra as systemic.

5.2. Discussion

The case study analysis, based on a combination of theories on innovation intermediaries and strategic niche management, proposes that government-affiliated intermediary organisations are likely to have a role in all niche internal processes. The building of social networks and learning processes and exploration are common but the strength and absence of specific roles differ. The results indicate that the more systemic effects, particularly through the articulation of expectations and visions, are dependent on the organisation’s financial independence and the duration of intermediation.

The study presented two clearly different types of government-affiliated intermediary organisations. Motiva implements sustainability policies in the energy domain and aims to promote new practices and technologies but within the given regime and political context. Sitra purposefully acts as an actor aiming for regime renewal and system change but on a temporary basis. Yet both claimed part of their success to neutrality. With neutrality they refer to independence from public administration and politics, finance, or technology neutrality. These types of neutrality aid the intermediaries to gain trust and get different parties into new networks. Particularly the degree of detachment from public administration may be crucial, because Laschewski et al. (2002) argue that state involvement may formalise networks to a degree they lose the benefits of informal activities and personal relationships. For Motiva, this has been the case in point. Although having a role as a policy implementer, the partial detachment from administration has created trust among companies. Yet, simultaneously, some stakeholders criticised that Motiva’s financial dependence on a ministry limits its freedom to set its agenda and act freely, indicating a degree of lock-in to the existing regime.

The displayed technology neutrality means that an intermediary may find it hard to be involved in protecting a particular niche. The SNM literature has often described this activity in connection to specific technologies, for example, regarding transport biofuels (e.g. Ulmanen et al., 2009). Particularly, empowering a niche to destabilise existing regimes is likely to require strong, biased voicing of expectations and visions, going beyond mere sustainability goals. Some intermediaries, in effect, choose instead of neutrality, to seek an active role and face more resistance – which has been described potentially beneficial through broadening the debate on technological options (Boon et al., 2011). Even those seeking neutrality may be forced to take some position involving, for example, resource dependency and be biased towards cooperating with some parties and not others (Klerkx and Leeuws, 2009). Neither Motiva nor Sitra express preferences over renewable energy heating options, such as heat pumps or wood, or alternative motor powers, such as biofuels or electricity, but rather provide information and user experiences on them. While avoiding the ‘technological battle’ may be possible when time and resources are abundant, the urgency of climate action, financial crises, and extending scales from technologies to systems may well mean that more ‘directed’ transition intermediaries are needed. Moreover, it is likely that intermediaries due to their specific networking and articulation capacities are actors that are particularly important in empowering and destabilisation – gaining acceptance and legitimacy for new visions. Government-affiliated intermediaries have the benefit of neutrality over private funding with potential for improved legitimacy creation and actor-involvement. The stakeholder interviews indicate that a foundation is perceived freer than a government-owned company.
An issue that is little discussed in intermediary research is the temporal extent of intermediation. A sufficiently long 'sustained' engagement is necessary for systemic intermediaries to influence over the transitional period, while shorter periods may still aid early stages of niche development and destabilisation. Regarding the studied organisations, the purposeful aim towards systemic change, a fairly narrow focus in terms of operational subject, and neutrality in terms of finance are likely to make Sitra's activities influential in promoting socio-technical transition – akin to a policy-driven (Boon et al., 2011) but systemic (Hodson and Marvin, 2010) intermediary. Stakeholders indeed recognised Sitra's particular merits in challenging old structures, creating market disturbance and being broadminded. Yet, too a temporary nature of the activities influencing a particular regime means that it may not be able to foster sufficient niche development and destabilisation as both altering mental states and technological innovation take time. Concurrently, the temporary is a way to avoid the organisation getting locked-in to a regime. Motiva may, by influencing the behaviour and attitudes of actors and encouraging companies to act, contribute to transitions. It is unlikely to destabilise the system but has the benefit of a longer time period, with a risk of regime lock-in. Motiva much meets Backhaus's (2010) view of intermediaries as bottom-up policy implementers, supporters of new networks and expression of interests. Neither Sitra, despite its mission, nor Motiva are likely to be the key actors in potential energy transition. Sitra is an important early stage actor, intentionally systemic and independent from government funding but its Energy Programme was not sustained long enough, given that systemic transitions take decades. Motiva's long-term existence is important to maintain change activities triggered by others, akin to facilitating the energy efficiency audit and agreement system in Finland but broadening from that. Yet, it is much tied to the existing regime, particularly through ministerial guidance and funding.

The findings and discussion of this article point towards a need for more theoretical attention to the role of intermediaries in transitions, and particularly on the existence or lack of sustained systemic intermediaries. A further question this study poses is the extent to which policy supportive of government-affiliated sustainability intermediaries as a new form of governance (cf. Hodson and Marvin, 2010) could complement, or even replace, more traditional policies in promoting sustainability transitions – particularly when the role of policies for transitions has been rather ad hoc apart from the Netherlands (cf. Kern and Howlett, 2009). One such role could be a facilitator of 'hybrid forums' (cf. Garud and Gehman, 2012). This would require the establishment of more systemic intermediaries that would take on board activities akin to Sitra’s but with at least some capacity to sustain themselves longer during the transitional period.

This study shows that intermediaries, typically neglected in sustainability transitions literature, may be influential actors at least in niche building but possibly also in regime destabilisation (or lock-in). The empirics were limited to two in-depth case studies with government-affiliated intermediaries. More roles might emerge from data with a larger sample size. In addition, extending the scope to non-governmental intermediaries could reveal new aspects to neutrality and time, discussed above.

6. Conclusions

By integrating theories on innovation intermediaries and sustainability transitions, the article contributed novel insights into both literatures. It also presented two detailed case studies of government-affiliated energy intermediaries – a subject that has been little studied. A research gap regarding intermediary roles in sustainability transitions of socio-technical regimes was pointed out. The article provided particular input to the Strategic Niche Management (SNM) approach by specifying activities that underlie each of the three processes. It argued that the innovation intermediaries literature brings a useful addition to the attempts to gain more insights into actors and processes behind transitions, which should be further explored using and expanding the analytical framework created in this article. The framework was designed not to be exclusive to government-affiliated intermediaries, and can be applied to both intermediation and strategic niche management research more generally.

The empirical analysis of two government-affiliated intermediaries – a government-owned expert company promoting efficient and sustainable energy use Motiva and a government set-up foundation for sustainable well-being Sitra – demonstrated the variety of activities that intermediation in energy regime change involves. While both organisations engaged in some roles under each SNM process (articulation of expectations and visions, building of networks, learning processes at multiple dimensions), the organisations differed strongly in their portfolio of roles and projects.

Sitra is a temporary systemic intermediary, while Motiva represents a project-based policy-driven intermediary. To previous literature, the case analyses added new roles for innovation intermediation, most importantly ‘policy or regime renewal’. Moreover, they provided insight into the ‘neutrality’ of arbitration that can be described in terms of political, financial and technological neutrality. While complete neutrality may be impossible to achieve, it still implies that ‘neutral’ intermediaries are unlikely to favour particular ‘sustainability’ niches over others. Although financial neutrality is likely to aid sustainability transition, technological or even political neutrality can mean the opposite. Sustainability transitions need systemic intermediaries that voice new socio-technical visions and take them forward for a sustained period of time, given that transitions take decades. Sitra was found to possess several crucial attributes to a systemic intermediary, such as abilities to engage in challenging existing structures and voicing new visions as well as to pilot and invest in new niche development, but the temporality of engagement raised doubts regarding its transitional effects.

In sum, the article showed that there is a diversity of intermediation engaged in innovation and system transitions processes, some of which occurs in government-affiliated organisations – that may provide, if not an alternative, at least a complement to traditional, possibly more path dependent policymaking. It is important to note that, while top–down policy-implementing intermediaries have their role to play in regime change (or stability), the existence of more systemic intermediaries is likely to be crucial for achieving system-level innovations and engaging in debates related to regime destabilisation. Future research is needed to further explore the effects of duration and timing of intermediation on its effectiveness, taking into account potential regime lock-in risks. Equally, larger empirical samples are needed to generate more insights into the role of governmental versus private affiliation of intermediaries and of technology neutrality versus preference in transitions.

Appendix: Interviewees and interview themes.

- **Motiva** (interview duration 44–84 min)
  - Managing Director, 7.9.2011
  - Head of Unit, Monitoring and Evaluation, 7.9.2011
  - Head of Unit, Renewable Energy, 4.10.2011
  - Head of Unit, Energy Efficiency for Industry, 13.12.2011
- **Sitra** (interview duration 45–71 min)
  - Head of Unit, Energy Efficiency for Consumers and Services, 4.1.2012
Director of Energy Programme, 13.9.2011
Energy and Climate Change Lead, 18.10.2011
Senior Lead, Built Environment, 11.11.2011
Senior Lead, Venture Capital, 10.1.2012
Senior Lead, Consumer Behaviour, 17.1.2012

**Stakeholders** (interview duration 23–36 min.)
Ministry official, 1.6.2012
Researcher, 1.6.2012
Consultant, 15.6.2012
NGO employee, 25.6.2012
Company, 4.9.2012
Ministry official, 5.10.2012

**Interview themes**
Role and influence of Motiva/Sitra in the Finnish energy field
Relationship of Motiva/Sitra to government administration
Role of Motiva/Sitra in relation to Sitra/Motiva

Descriptions of key tasks of Motiva/Sitra and/or of tasks specific to the interviewee’s field of operation (processes behind task selection, change in tasks over time)
Nature and target groups of services offered generally or in the interviewee’s field of operation
Cooperation and networks
Potential key roles in any innovation/technology processes; participation in piloting and testing
Impacts/evaluation of Motiva's/Sitra’s activities generally or in the interviewee’s field of operation
Interview-specific questions related to projects/activities that the interviewee knows about

**Appendix B. Supplementary data**

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.respol.2014.02.007.

**References**

Hodson, M., Marvin, S., 2010. Can cities shape socio-technical transitions and how would we know if they were? Research Policy 39, 477–485.