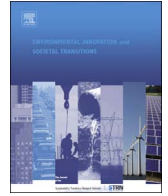




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## Articulations of sustainability transition agency. Mundane transition work among consulting engineers

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### ABSTRACT

This paper analyses sustainability transition agency among consulting engineers, who exercise considerable influence in a wide spectrum of environmental decision-making through advice, calculations and design. They work in an ambiguous space of governmental requirements, environmental politics, cost considerations, and professional standards. Nevertheless, many consulting engineers engage with sustainability transitions in a mundane and modest way. To a varying degree, they combine four kinds of transition work: (1) sustainable technological problem solving, (2) persuasion work, (3) mediation work, and (4) institutional work. On this basis, we propose a model of sustainability transition agency where sustainable technological problem solving is the core activity as a precondition of necessary sociotechnical change. The three latter kinds of transition work may facilitate and support the core activity. The study also shows that environmental regulations, rules and standards are important to sustainability transition work among consulting engineers, guiding but also providing more space for such efforts.

### 1. Introduction

Successful sustainable transitions require positive engagement from various professional groups. Not the least, professionals in the private sector influence a wide spectrum of environmental decision-making, while working in ambiguous spaces shaped by governmental requirements, environmental politics, business considerations, and professional standards. This paper explores how such spaces are navigated with a focus on consulting engineers, asking about their exercise of sustainability transition agency and the effects of governmental environmental policies, including standards and regulations.

Transition actors are people or organisations who are, intentionally or not, agents of change to make society more sustainable (Åm, 2015). Since sustainability transitions also include small steps and nudging, such actors may contribute in modest as well as radical ways. The former may be the most realistic expectation with regard to private sector professionals. Nevertheless, it is important to study the enactment of sustainability transitions in professionals' everyday practices. In this manner, we may better understand the scope and content of such sustainability transition agency and the measures that influence professionals' latitude and choice of action.

We use the concepts of transition actors and transition agency to highlight environmentally relevant strategies and activities of consulting engineers. Moreover, we are concerned with the potentially complex distribution of transition agency, including the varying degree of participation in sustainability transition efforts. We chose to study consulting engineers for a number of reasons. First, they are a fairly large group of private sector professionals (around 11 000 in Norway). Second, and more important, their work has significant and wide-ranging environmental consequences. Consulting engineers engage in projects that shape and reshape the

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physical qualities of nature and culture, of landscapes and the built environment. Consulting engineering companies contribute importantly to physical planning, construction of buildings (including structural engineering, electrical engineering, and heating, ventilation and sanitation engineering), construction of infrastructure, transport planning, and water management. In such areas, they provide technological advice, calculations and designs on a contractual basis, serving builders, industrial companies, public institutions, etc. (Solli, 2013).

Consulting engineering companies have to be competitive with regard to quality, costs, and timely delivery as well as in responding to their customers' needs and requirements. According to previous research, these features tend to make consulting engineers conservative in their problem solving (Hojem and Lagesen, 2012; Buch, 2016). We want to reconsider such characteristics. Even modest efforts at more sustainable problem solving may be important, including efforts like improved energy efficiency of buildings, increased use of environmentally friendly materials, more sustainable building practices and waste management, more environmentally friendly transport systems, and improved sustainability of factories, marine installations, etc. Thus, consulting engineers are an interesting case for analysing professionals that may contribute to sustainability transitions and in different ways. Some may do this moderately and mundane, others in more radical ways. We examine this by analysing how consulting engineers participate in and/or modulate sustainability transition efforts.

We use interviews with employees in and managers of consulting engineering companies to illuminate these issues and to contribute to sustainability transition studies by studying the navigation of what we expect to be ambiguous spaces of such private sector professionals' transitions agency. This includes the potentially configurational effects of government environmental policy efforts, with an emphasis on how consulting engineers interpret these efforts. The rest of the paper is structured as follows: we begin by outlining the theoretical point of departure and the methods underlying the collection of data. Then we present findings. In this part, we first give an overview of the practices of transition agency among consulting engineers. Second, we discuss the role of environmental policy in shaping these practices, before moving onto possible effects of environmental governmentality and professionalism. Finally, we present our conclusions and propose a model of sustainability transition agency.

## 2. The making of transition actors: theoretical perspectives

The most prominent approaches within the fast-growing field of sustainability transitions studies see innovation as a particularly critical activity for change, albeit in different ways (Markard et al., 2012). For example, the highly influential multi-level perspective (MLP) analyses transitions as the outcome of interaction between three levels: landscape, regime and niche (Rip and Kemp, 1998; Geels, 2002; Schot and Geels, 2008). Socio-technical regimes impose a logic of and provide direction to incremental socio-technical change along established pathways of development, which makes socio-technical systems difficult to transform (Markard et al., 2012). To achieve sustainability transitions, MLP scholars argue, one needs to find ways of reorienting or producing radical changes in such regimes. Many consider protecting and nurturing sustainable innovations through strategic niche management to be the main strategy of change. MLP scholars also focus on the landscape level since activities here may facilitate or prevent changes in the socio-technical regime.

Governments are key actors with regard to sustainability transitions (e.g., Kemp et al., 2005). Not the least, they set goals and timelines for improvements, using a mix of policy instruments. Often, discussions of the effects of such instruments distinguish between market-based instruments like taxes and non-market-based measures, which in the environmental context may comprise direct environmental regulations, active technology support, and public R&D support. In this paper, such classifications are not important. Our concern has been to identify the environmental policy instruments and governmental sustainability goals that the interviewed consulting engineers emphasised in their accounts of their work. Furthermore, we explore what they say about the effects of these policy efforts.

Fischer and Newig (2016) review the role of actors in sustainability transitions studies. They present four different actor typologies: systemic, institutional, governance and intermediaries. Moreover, actors may be supporters or opponents of transitions. As an example of a systemic typology, Fischer and Newig propose an interpretation of MLP where they distinguish between niche and regime actors. They argue that both categories of actors have limited agency. Niche actors cater for technological innovation that the regime may adopt, but they depend on government policy. According to Fischer and Newig's review, regime actors tend to oppose transition, but they may become supportive if they see the transition to be in their own interests.

Much of the literature that discuss agency with respect to sustainability transitions focuses on the role of actors as builders or transformers of socio-technical systems (Farla et al., 2012). Actors' interests and expectations may be important to such engagement (Bakker, 2014). Geels et al. (2016) provide a comprehensive analysis of system building strategies in their study of low carbon energy transition pathways in German and the UK, highlighting the importance of agency in shaping such pathways. Fuenfschilling and Truffer (2016) helpfully suggest the concept of institutional work to describe agency in developing socio-technical systems.

This paper also takes inspiration from Shove and Walker's (2007) call for greater attention toward the actors that are involved in the everyday politics of transition processes. Our focus on consulting engineers represents an attention to mundane, potentially incremental acts of transition agency among professionals. This does not imply that we dismiss the importance of institutional work (Fuenfschilling and Truffer, 2016). While government policies influence professions, professions may participate in the development as well as the enforcement of such policies (Abbott, 1988; Suddaby and Viale, 2011).

As noted above, Fischer and Newig (2016) suggest studying niche and regime actors. However, we find their system topology limiting. Instead, we pursue an interactional approach, which emphasises sense making and actors' practices as the outcome of relations to other humans and non-humans (e.g., Law, 1994; Latour, 2005). Thus, we analyse what consulting engineers say they do, the meaning they attach to their work, their accounts of the diversity, distribution and content of the involved agency, and how they

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