



From Resistance to Transformation. Politics of Experimentation with New Energy Systems

J.G. Hoffman

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Politics of experimentation
with new energy systems

Jesse Hoffman

Summary

The transition to a post-fossil society is one of the major challenges of the 21st century. Across the world, groups of policymakers, scientists, citizens and industry leaders have been working together to find alternative and more sustainable forms of energy production. Yet, though their commitment is admirable, progress has been modest. This study aims to understand the difficulties and opportunities in the relationship between sustainable innovations and incumbent groups.

A key to understanding the transformation that we so badly need is the *creativity* through which the aforementioned actors organize their local energy experiments. In incumbent organizations we find deeply vested habits, routines and material structures that over time have grown together with the use of energy from coal, oil and natural gas. Through energy experiments groups can become creatively aware of those routines and start to see new links between energy and other practices, relevant for a sustainable energy economy, like food production, mobility and housing. Doing so enables groups to see possibilities for the future that remained invisible in the past.

On the basis of ethnographic research, Hoffman shows how creativity emerges in response to the power of vested structures and how these structures can be transformed while they also 'fight back'. Cases include energy innovations in the port of Rotterdam in the Netherlands, Dutch greenhouse farming and the Danish energy sector. The framework of creativity developed throughout the book helps to understand how initial resistances may turn into support for societal transformation. In doing so it shows that innovative practices offer a space for joint action in which actors experiment and learn about the common good, mix values and goals, form a new community of practice and cultivate a context for change. Such a perspective on creativity enables both a broader and deeper understanding of the meaning of experiments for democratic societies in the 21st century.

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SUMMARY

One of the major challenges of the 21st century is the transition to new energy systems. It is widely understood that our use of fossil energy sources is no longer tenable because of its impact in terms of climate change, environmental pollution and the depletion of the earth's resources. Across the world, groups of policymakers, scientists, citizens and industry leaders have been working together to find alternative and more sustainable forms of energy production. Yet, though their commitment is admirable, progress has been modest. A crucial problem seems to be that our prevailing social and political orders — i.e. society's prevailing preferences, customs, routines and infrastructures — tend to resist major changes. While technological knowledge of inventive alternative solutions is abundant, this is not the case when it comes to changing deeply vested identities, habits and routines. As a result, the main problem we face is how an energy transition may be realized in practice.

A key to understanding the transformation we so badly need is the *creativity* through which the aforementioned actors organize their energy experiments. To illustrate my argument I start this book with an example of the opera in Dusseldorf in Germany. Attempts to introduce energy and resource saving devices and practices in the opera were, at first, resisted by the musicians. Over time, however, a creative dynamic was born in which both musicians and opera managers joined hands to transform opera production. This example illustrates that initial resistance to change may turn into a situation in which the power exercised in existing practices, like opera production, comes to the advantage of energy innovations. In this volume I seek to explore how we might better understand this interplay between power and creativity. In doing so, I follow and examine several networks of scientists, citizens, companies and policymakers that have worked to introduce new energy practices. This exploration will help to refine existing theories of societal transformation. Moreover, it will develop a lens for observing and understanding the role of creative processes in empowering society's transition to sustainable development.

Toward a relational framework of power and creativity

In this volume I seek to contribute to leading debates on the role of power in societal transitions. Firstly, I intend to examine how, exactly, innovative initiatives may change existing structures and thereby create conditions that are more favorable to innovations. Secondly, I will show how actors break with habits and routines in addressing sustainability problems. Thirdly, I will conceptualize how a growing reflexivity enables actors – both innovators *per se* and innovative incumbent parties – to exercise power in moving their innovative projects forward. In addition, I aim to provide methodological insights into the study of innovation in real time, and insights for practitioners that are working on transitions in practice.

The central research question I pose is how the creative work of actors interacts with the exercise of power in innovative activities aimed at the introduction of new energy practices. In answering this question, I seek to build on, elaborate, improve and refine, state-of-the-art theories of power in transition studies. In conceptualizing power, these theories make a distinction between *niches* of innovative activities and *regimes* of incumbent networks and the prevailing ways of thinking acting in which these are embedded. A current omission in this literature is, I argue, a conceptualization of the *relational* dynamics between niches and regimes. One attempt to conceptualize power dynamics from a relational perspective is proposed by John Grin (2010), who draws on the work of Bas Arts and Jan Van Tatenhove (2004) to develop a framework that combines several forms of power. His rudimentary framework offers a promising avenue to theorize and examine how actors in innovative initiatives may step-by-step transform the power embedded in resources, institutions, and infrastructures.

A lens on power and creativity from a long-term perspective

In chapter 2, I explore Grin's relational framework in a longitudinal case study of wind energy experiments in Denmark between the 1950s and 1970s. I analyze how his theory helps to understand the interplay between wind energy experiments and existing social networks, infrastructures, and institutions. For this case study I draw extensively on a secondary-analysis of the dissertation on wind energy innovation by Rinie van Est (1999). This empirical exploration identifies several omissions in Grin's framework, all of which relate to the relationships between creativity, the relational nature of power, and the capacity of actors to recognize trends. In the rest of chapter 2, I develop a framework that offers a refined relational lens on creativity and power in transitions.

Fine-grinding our relational lens for studying creativity in action

The analysis presented in chapter 2 demonstrates the usefulness of a longitudinal perspective on innovative experiments. However, this meta-analysis omits the

concrete interactions between actors. More specifically, it raises the question how innovators and incumbent parties cooperate in innovating and how they redefine the relation between the 'new' and the 'old' in doing so. In chapter 3, I address this question by moving to and fro between theorizing power and creativity and a case study concerning a project for biofuels production in the Port of Rotterdam in the Netherlands. I draw on the concept of *interstitial space* (Bhabha 1990) to describe the space that emerges *in between* collaborating innovators and incumbents. This concept enables me to examine the ambiguous, uncertain, and creative character of such interactions. I collected the data for this study through a yearlong weekly presence in the office of an innovator that played a central role in the biofuels project. I also studied relevant (policy) documents and interviewed people that were, or had been, involved.

On the basis of the data I collected, this chapter identifies three manifestations of creativity in the exchange between innovators and incumbent parties in the interstitial space of the biofuels project. I conceptualize these manifestations in this chapter as follows: Firstly, on the basis of this case study, I describe the creativity in projecting change by identifying (potential) relationships between companies, scientists, policymakers and others, as well as material artifacts; a process that I call *creativity in articulation*. Secondly, there is the *creativity in innovation* through which innovators link promising concepts (like biofuels) to the problems that actors in existing practices are struggling with. Thirdly, I identify that *creativity in consolidation* is required to embed innovative designs in existing activities in companies and policy bodies. Further, I conclude that the evolution of the collaborations in innovative projects as well as the exercise of power from a relational perspective can be understood through the analysis of the interactions between these three forms of creativity, which I dub the *trialectics of creativity*.

A sharpened relational focus helps to closely analyze how people draw on their environment to foster transitional change. Nonetheless, this refined framework also raises a new question, namely about the destabilization of standing production processes. How do these processes and activities lose their once taken-for-granted character and become an object of change? In chapter 4, I address this question by looking into the relationship between the de-routinization (Giddens 1979, p. 220) of Dutch horticulture in the 1990s and 2000s, and an innovative effort to rethink and redesign greenhouses in order to radically save energy consumption. For this case study I draw on the concept of the *epistemic object* developed by Knorr-Cetina (2001). I collected data for this study through the participation during several months in the cultivation of tomatoes in a greenhouse farm designed according to the Closed Greenhouse concept. In addition, I followed extension workers, interviewed key players, observed

the meetings of an entrepreneurial platform and developed a media analysis.

The empirical material I collected enabled me to examine how actors in developing their initiatives hooked onto the broader transformatory dynamics of horticulture. In doing so, I conclude that all the manifestations of creativity I have observed were triggered by the appreciation of the greenhouse as an object whose current state is incomplete and may take new properties and new forms. I infer that the incompleteness enabled innovators and incumbent parties alike to articulate new futures, to create new designs, and to envision new ways of transforming existing habits and routines.

The role of context in transitions

The case studies of Chapter 3 and 4 contribute to the sophistication of the framework for analyzing creativity and power in transitions. This framework has been developed around cases that are situated in socio-historical contexts that are substantially different from one another. This enables answering the question in which way the contextual embedding of projects impacts an actor's ability to incite transitional change, which is the subject of Chapter 5.

This chapter not only demonstrates considerable differences between the two cases; it also highlights the fact that these differences can be understood on the basis of two dimensions of context. The first dimension is the temporality of agency, that is, the temporal aspect in the orientation of one's actions, to the past or the future of a domain, which enables actors to make sense of the present. For the interpretation of change it is not only important how actors imagine the future, but also how they start to rethink their past. The second dimension is the *materiality* of artifacts and infrastructures in both domains. From the analysis follows that material objects not only structure action but also enable creative action. The incompleteness of objects always allows for new combinations and, accordingly, for the articulation of new images of the future.

Conclusions and discussion

Chapter six concludes this volume and discusses its major findings. In this chapter I present three findings that answer the overarching question. The first finding relates to the appreciation of the incompleteness of material and social forms, which provides leeway in imagining new futures for the contexts involved. The second finding is about the social energy that is released in the struggle over articulating, innovating and consolidating change. Related to this, the third finding describes that actors complement each other in actively contributing to change and in doing so, enable projects to move forward. These findings, when read together, show how what I call the *trialectics of creativity* offers a foothold for understanding efforts at invoking transitional change from a relational perspective on power.

Next, this chapter discusses how this empirically informed lens contributes to academic literature. Its contribution is, I argue, to provide a framework to analyze how actors move from a situation in which change is experienced as a source of trouble and uncertainty to being *empowered-in-situ*, in a situation in which actors take ownerships over — and responsibility for — their own future. Firstly it contributes to recent discussions in policy studies on the study of *path creation*. Secondly, it contributes to recent debates on social theories of time and materiality. Thirdly, it offers several insights into the relationship between power and actors' capacity to develop reflexivity in using their environment to achieve their own objectives.

In addition to these theoretical contributions, I reflect in this chapter on the methodological insights in my research. A major inference from my fieldwork experiences is the importance of appreciating breakdown and failure of projects as opportunities for reflection and creativity. Finally, I conclude by formulating five insights into the relation between power and creativity in real-world experiments that follow from my analysis and that may come to the benefit of practitioners.