



## Review

# Energy, economics, and performativity: Reviewing theoretical advances in social studies of markets and energy



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## ABSTRACT

For many years, energy market design has held great promises as a solution to current energy issues; ranging from increasing international trade to emissions reduction, the securing of future electricity capacity, and increasing flexibility amid growing intermittent renewable energy resources. The emerging economic understandings of the energy infrastructure motivate conceptual and methodological innovations in the social sciences, which this paper pursues. Its first part describes recent advances in social studies of markets, which seek greater appreciation of the role of economics in the formation of markets via economic theories, instruments, and many other means. The second part focuses on emerging studies which draw on these approaches to examine energy systems including their markets, liberalisation, and sustainability. The essay brings together social studies of markets with energy and opens up important topics for understanding current energy transitions. These include how financial systems can be treated as key components of the socio-technical energy system in transition; and conversely, how the case of energy adds to the theories of social studies of markets and economics by highlighting manifold interdependencies between economics, engineering problems, existing infrastructures, and political contentions when market-based energy is at stake.

## 1. Introduction

For many years, energy market design has held great promises as a solution to current energy issues; ranging from increasing international trade to emissions reduction, the securing of future electricity capacity, and increasing flexibility in electricity distribution amid growing intermittent renewable energy resources. Energy policy makers, engineers, and market designers find common ground in optimizing complex infrastructures through market mechanisms, such as introducing time-dependent electricity prices [1–3] and various kinds of energy trade from real-time and day-ahead to carbon emissions trading and futures exchanges much further ahead in time [4,5]. Expertise on energy economics and energy market behaviour has been organized through specialized associations, journals, and conferences for several decades: the International Association for Energy Economics was founded in 1977 to further “the knowledge, understanding, and application of economics across all aspects of energy” [6], while the British Institute for Energy Economics dates to 1985. Economic assumptions about energy market participants have also been embedded in ICTs that bring together economic energy producers and consumers in new ways, exemplified by ‘smart’ energy meters that are rolled out on a large scale in a great number of countries all over the

world (see e.g. [3,7,8]).

The emerging energy infrastructure and its economic understandings open up several points of entry for social science research. While many policies and experts concur on the economic benefits of optimizing infrastructures via market mechanisms, others, inspired by social science perspectives, may see these economic assumptions about energy producers and consumers as ‘under-socialized’ and incomplete. As many have pointed out, a number of issues around current energy demands and environmental problems may not fit into a sharp economic framing: social practices of energy use [9–11] and sustainability transitions [12,13] are notably ‘embedded’ in social relations and the wider society in a rich variety of ways. Modern economics, in contrast, assumes that economic agents and their activities are ‘dis-embedded’ from society [14].

But there is also another option for participating in these debates. It draws from recent advances in social studies of markets, which seek greater appreciation of the role of economics in the formation of markets via economic theories, instruments, and many other means. As such, this approach – rather than treating it as a mere ideology – takes economics seriously as knowledge and activity that participates in actually shaping the economy and the society more widely [15]. This *social studies of markets* explores economics pragmatically by its

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successes or failures in those particular instances where it was used by actors [16]. While these studies advance a number of concepts, an oft-cited term summarises their contribution by arguing that economics is *performative*. This means that the use of economics not only describes, but also participates in changing reality to more – or less – accordance with economic theory than before [17,18].

Recently, a growing number of social science works have drawn on these approaches to examine energy systems, markets, and diverse topical energy issues; from renewable energy integration to electricity capacity, liberalization, and sustainability. With some notable exceptions of critical analysis (especially [19,15,20]), these works utilize social studies of markets mainly to show that these perspectives can be applied to contemporary energy markets, energy transitions, and related issues. Meanwhile, in other discussions, critiques of the performativity concept and the social studies of markets show an impressive breadth. The critics argue that performativity simply recapitulates the professional ideology of economists by assuming that markets confirm economic theory; furthermore, in many empirical cases, markets do not function in practice as economic theory foresees (see e.g. [21–23]). On a more positive note, there is already evidence that energy social research poses unique strengths in addressing some of these critical issues in the social studies of markets (e.g. [15]). My essay brings the social science perspectives on markets and energy together and asks the following questions:

- What novel and interesting results do social studies of markets perspectives bring to energy social research?
- What unique insights can the study of energy bring to the social studies of markets and its critics?

Regarding the first question, the essay develops the argument that financial systems should be treated as key components of socio-technical energy systems and reviews a number of studies that attain this aim, starting from classic work within Science and Technology Studies (STS) literature. This focus means not only that social studies of markets can be mapped onto the study of contemporary energy markets – even if that is of considerable interest as I try so show. Rather, social studies of markets help unpack how the configuration of financial systems – shaping and shaped by economic theory, measuring techniques, economic actors, and financial products – greatly matters for what the existing energy systems are like and how they may be transformed toward greater sustainability.

For the second question, along with others [19,15,20], the essay argues that encountering energy as a topic for the social studies of markets leads to a fruitful revision of these approaches and useful clarifications against their critics. Here, I show that many criticisms seem to assume a stripped-down version of the performativity thesis, where markets are direct materializations of economic theory. However, the case of energy – and indeed, recent decade's advances in social studies of markets [17,24–26] – do not conform to this stripped-down understanding of performativity. Market-based energy provision clearly depends upon political contentions, engineering issues, and histories in interplay with economics and social studies of market provides useful tools for studying how this manifests in practice. However, some contradictions in social studies of markets – especially concerning their key concepts and scopes – may continue to blur this valuable contribution as I discuss below.

While this essay reviews several works in energy social research, the relationship between the selected studies and the field at large should be clarified. A recent review of this field [27] finds case studies on a particular energy technology, studies at length on particular countries, and quantitative methods – such as economic modeling, econometric analysis, and cost benefit analysis – to be prominent in the energy social science discussion. Where many studies hence use economics tools across different aspects of energy, much fewer have developed social studies of markets types of questions: concerning how knowledge about

energy markets and their participants may bring about these subjects rather than merely describing them (for key exceptions see [28–30]). Furthermore, in disciplinary terms, sociology, anthropology, and STS remain relatively minor points of departures in energy social research, but have unique insights in rethinking the relationship between energy, economics, and performativity. This essay contributes to energy social research by raising these types of viewpoints and their relevance in understanding both energy transitions and advances in the social studies of market programme.

In two ensuing parts of this essay, I discuss first social studies of markets and then energy social research that utilizes it. Both parts are structured similarly. They start with explaining how these research areas emerged in relation to other perspectives on similar issues; their key concepts and focuses with examples; what problems and critiques are associated with these research lines; and how bringing together social studies of markets with energy social research provides useful tools for further addressing some of these problems and critiques. A concluding part summarises these contributions and identifies further challenges in this area for future research.

## 2. Part I: reviewing social studies of markets and performativity

### 2.1. Social studies of markets within economic sociology

Modern economics has had a critical relationship to many social sciences, sociology particularly, since their onset in the 19th century [31]. Strictly speaking, mainstream economics is interested in efficient allocation of resources and does not consider the conditions that make market exchanges possible and hold social order together [32, p. 140]. The typical sociological counterargument is that this offers merely one framing of social reality among many others and as such, generates unrealistic assumptions about rational economic agents and the utility that they seek [15, p. 831]. Economic sociology contributes to the understanding of the economy – and market capitalism more particularly (e.g. [33]) – via studying its contextual, historical, and institutional aspects [31]. These themes have renewed their importance after the banking and debt crises that broke in 2008 (e.g. [34–36]).

Within this much broader field of economic sociology, this essay focuses on a small subset that is called *social studies of markets* (a name this essay uses) or *social studies of finance*, a field intrinsically linked with Science and Technology Studies (STS). In the 1990s, certain market scholars, especially the French sociologist Callon [14], begun to distance themselves from social science thinking that regards economics as a mere ideology. In so doing, their focus on economics, the economy, and society shifted considerably. Rather than embedding calculative economic actions and markets within the wider society – as many social scientists had already done – they wanted to examine economic calculations, actions, and markets as such as their research objects. The concern became which processes “make calculative economic action and markets possible” [37, p. 12].

The concept of *economics* as these scholars have understood is broad if somewhat ambiguous. On the one hand, economics includes all types of economic thought and activities that are utilized in knowing the economy: not only economic theory, but also economic instruments, procedures, data, marketing, and accounting practices both within and beyond the academia. Political theorist and historian Mitchell [38, p. 298] includes design and marketing of goods, calculations and forecasts by banks and investors, business school and law school case studies, think tank activities, and international development as exemplars of this economics in the widest meaning. This constitutes an expertise that Callon famously named as “economists in the wild” in contrast to academic “caged economists” [39, p. 196]. So, in one way, *economics* includes all knowledge that constitutes the *economy* [40]. On the other hand, when these scholars have studied economics, it has usually started with a fairly disciplinary understanding, focusing on specific market-like arrangements [14,15] or financial equations and their use

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