

Since Germany decided to transform its energy sector from nuclear and coal to renewables within the next four decades, plenty of sociotechnical futures considering the power network's architecture have been discussed. These sociotechnical futures, which have often been labelled with different promising names, project a power network which will transmit energy as well as digital information, and which will be able to integrate and manage renewable energy through new information and communication technologies.

Many social science studies have pointed out that such projections of sociotechnical futures play an important role in science and technology innovation. By pointing at particular future possibilities and by bracketing off others, they act as a central means of legitimizing policy decisions, mobilizing support and resources, enabling coordination between heterogeneous and dispersed agency and guiding the design of nation-specific scientific and technological projects. However, most of these studies have been mainly concerned with futures projected in narratives such as visions, scenarios and expectation statements, whereas there have been relatively few studies focusing on futures projected in computer simulations. At the same time, computer simulations have become a powerful and widely used tool for creating sociotechnical futures in general, and for power network futures in particular.

My dissertation addresses this research gap by focusing on computer simulations as means of projection of sociotechnical futures. Inspired by Science and Technology Studies (STS), my research investigates the performativity of simulated futures by analyzing the strategies and

THE PERFORMATIVITY OF SIMULATED FUTURES OF POWER NETWORKS AND THE PRODUCTION OF ANTICIPATORY KNOWLEDGE

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practices of making power network simulations in several scientific as well as industry research projects. My dissertation assumes that simulated futures act as means of defuturization (closing future possibilities) and futurization (opening the future possibilities) at the same time. On the one hand, through their realization in digital materiality in the present, they close the horizon of possible power network developments. On the other hand, through their own construction as novelty and through their digital material resistance and evocativeness, they open opportunities for new power network futures, which in turn are channelled into new discourses and articulated in new visions. Accordingly, this dissertation analyzes the relationship between imagination and realization in digital materiality and between the processes of futurization and defuturization. Further, it investigates how simulations as partly imagined and partly realized futures contribute to the production of anticipatory knowledge, which in turn is channelled into the design and the development of the future power network.

By addressing these questions, my dissertation aims to contribute to innovation studies, which has been mainly concerned with the performativity of sociotechnical futures projected in narratives. If the making of computer simulations embodies a different mode of projecting and anticipating the future presents, then we need a better understanding of how this kind of anticipatory knowledge guides research processes and practices, legitimizes policy as well as research decisions, and how it shapes the design and development of science and technology innovations.

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