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Title: The role of ideals in the recent resurgence of the hydrogen hype in the Netherlands, Germany, and Belgium.

Abstract: The impact of expectations in shaping social-technical transitions is widely recognized, such as the transition of the energy system. Hypes are an important aspect of expectations that give rise to their own dynamics, often described as the hype cycle in literature. Emerging technologies are generally subjective to changing expectations and fluctuating societal excitement. However, little attention has been paid to the role of ideals in this process. Nonetheless, the idealization of emerging technologies could contribute to a hype characterized by overheated expectations. Therefore, utopian aspirations regarding emerging technologies, resulting from ideals, are expected to influence the development of sociotechnical systems. In this study, we use the example of hydrogen technologies to illustrate the possible driving force of ideals in the current hydrogen hype. This case is particularly interesting since hydrogen has experienced several hypes in the last decades. In the latest hype, hydrogen is often viewed as a promising or even key solution for sustainable long-haul transport and industry and seasonal storage of renewable energy, indispensable for a successful energy transition. However, a full understanding of the current hydrogen hype requires an analysis of the ideals that drive it. Therefore, the goal of this research is to get a better understanding of the role of ideals in the latest hydrogen hype. The focus of this research lies on the role of ideals by unraveling utopian frames persistent in the political debate on hydrogen in the Netherlands, Germany, and Belgium. These neighboring countries have a strong political interest in hydrogen, are home to large industrial ports where much of the hydrogen demand is located and accommodate a well-developed natural gas infrastructure. To gain insight in the ideals and related utopian frames that drive the current hydrogen hype in the national political debates in the Netherlands, Germany and Belgium, a content analysis is conducted of national political debates on hydrogen storage over the last three years. The results show which ideals are driving the political discussion in the recent resurgence of the hydrogen hype in these three countries.

Key words: emerging technologies, hydrogen, large-scale energy storage, ideals, hypes