frontiers | Frontiers in Energy Research

EDITORIAL
published: 08 April 2022
doi: 10.3389/fenrg.2022.895127

Editorial: Rethinking Green Energy Development: Cognitive Biases

Quande Qin[1]*, *Lin Zhang*[2], *Xunpeng Shi*[3] and *Bangzhu Zhu*[4]

[1]Shenzhen University, Shenzhen, China, [2]City University of Hongkong, Hongkong, China, [3]University of Technology Sydney, Sydney, Austria, [4]Guangxi University, Nanning, China

Keywords: cognitive bias, energy system, green energy, energy transition, energy policy

Editorial on the Research Topic

Rethinking Green Energy Development: Cognitive Biases

Green energy development is a key strategy during the energy transition which is a process of large-scale socio-technological change (Geels, 2014). Due to the technical complexity and social reflexivity of the energy system (Geels, 2002; Loorbach, 2010), cognitive biases towards the green energy system is inevitable. Cognitive biases pose great challenges to achieve consensus for contemporary policy making. One effective step for addressing this challenge, as the socio-technological theorists have suggested, is to explore and exhibit the multiplicity of value, the complexity of the socio-technological system, and the reflexivity of such system as well (Rip and Kemp, 1998; Coglianese et al., 1999; Rotmans et al., 2001; Kemp et al., 2007). Motivated by this, this special issue includes a collection of nine studies from researchers with distinctive backgrounds on the issue of green energy.

Four papers in this issue have shed important light on the multiplicity of values. Specifically, Hu et al. suggest how difficult it is to simultaneously account and balance the economic value and the environmental impacts of shale gas extraction. Shale gas has been recognized as a type of unconventional energy that somehow can enlarge the possibility of relying on fossil fuels. Similarly, Lin et al. address the challenges on integrating both economic value and green trust during the transition from an existing product to a disruptive green product. Fan et al. highlight that the public evaluation on China's energy storage projects have multiple dimensions. Li et al. have developed an acceptance model by capturing various aspects of an individual's belief. They used this model to reveal the public attitude toward the commercial fleet of methanol vehicles in China.

The energy system is complex that any analysis on the performance of a specific technical tool in the green energy domain could be. As such, researchers should expand the analytic scope when approaching problems related to green energy. However, it could also be in vain to conduct an analysis that covers the entire energy system. In other words, the analysis on energy system should find a "midway" between specificity and abstraction. In this regard, Xue et al., Zhang and Gu, Guo et al. and Chen et al. are good examples. The analytic scopes of these studies are energy consuming sectors, social capital, digital finance, and information technology investment, respectively. Those terms refer to either a manageable sub-sector (Xue et al.) or a controllable "fluid" that runs throughout the energy system (Zhang and Gu, Guo et al. and Chen et al.). To overcome cognitive biases also means to have more attention paid to the invisible depth. Social capital, digital finance and information technology investment are invisible relative to engineering projects. Each of these invisible elements, however, has profound impact on the landscape of the entire energy system. The above studies also have methodological implications on how to quantitatively approach a complex social-technological system. Xue et al. have applied a novel slack-based data envelopment analysis,

Edited and reviewed by:
Simone Bastianoni,
University of Siena, Italy

***Correspondence:**
Quande Qin
qinquande@gmail.com

Specialty section:
This article was submitted to Sustainable Energy Systems and Policies, a section of the journal Frontiers in Energy Research

Received: *13 March 2022*
Accepted: *21 March 2022*
Published: *08 April 2022*

Citation:
Qin Q, Zhang L, Shi X and Zhu B (2022) Editorial: Rethinking Green Energy Development: Cognitive Biases. Front. Energy Res. 10:895127. doi: 10.3389/fenrg.2022.895127

which is insightful to other sub-systems of energy. Zhang and Gu have conducted a panel data regression model to account for environment governance efficiency. They also set an example for how to quantify social capital with official data.

The energy system is reflexive, with both top-down and bottom-up cognitive influences in the energy system. Reflexivity runs through the supply chains of the energy industry, through the decision loops of energy policy, and through the multiple levels of the entire energy system. As such, the consumer acceptance and the public attitude play a key role in green energy development. On one hand, consumer acceptance and public attitude are affected by the knowhow of experts and policy makers. One the other hand, experts' and policy makers' knowledge should be adjusted according to the feedbacks from consumers and the public. However, there exists a so called "knowledge deficit" which has too overwhelmingly emphasized on the knowledge of experts and policy makers. Now it is the time to increase the cumulation of consumer knowledge and public opinions. This is why five manuscripts (Fan et al., Hu et al., Li et al., Lin et al., and Jiang et al.) from this collection have focused on either the consumer cognition or the public attitude. Notably, Fan et al. find that the public attitude toward energy storage projects presents a cognitive bias: the public opinions of energy storage are usually not the same even for the same issue. Representation distortion could happen during a survey, as the survey hosts and the survey respondents are associated in reflexive chains. Fan et al. demonstrate on how to dig undistorted information from the corpus of natural language, which can provide more real and credible information than survey data.

The journal Frontiers in Energy Research has provided an international platform for green energy communications. This collection reveals how cognitive biases can arise from monotony of value, from oversimplification in the analysis of green energy development and from ignoring the voice of consumer and the public. Therefore, this special issue points out that the existence of cognitive bias could slow down the transition towards green energy. Future green investment and policy making shall address the cognitive bias to overcome the limits of consensus and regime resistance against green energy transition.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

REFERENCES

Coglianese, C. (1999). The Limits of Consensus: The Environmental protection System in Transition: Toward a More Desirable Future. *Environ. Sci. Pol. Sustain. Develop.* 41 (3), 28–33. doi:10.1080/00139159909604620

Geels, F. W. (2014). Regime Resistance against Low-Carbon Transitions: Introducing Politics and Power into the Multi-Level Perspective. *Theor. Cult. Soc.* 31 (5), 21–40. doi:10.1177/0263276414531627

Geels, F. W. (2002). Technological Transitions as Evolutionary Reconfiguration Processes: a Multi-Level Perspective and a Case-Study. *Res. Pol.* 31 (8-9), 1257–1274. doi:10.1016/s0048-7333(02)00062-8

Kemp, R., Rotmans, J., and Loorbach, D. (2007). Assessing the Dutch Energy Transition Policy: How Does it deal with Dilemmas of Managing Transitions? *J. Environ. Pol. Plann.* 9 (3-4), 315–331. doi:10.1080/15239080701622816

Loorbach, D. (2010). Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework. *Governance* 23 (1), 161–183. doi:10.1111/j.1468-0491.2009.01471.x

Rip, A., and Kemp, R. (1998). Technological Change. *Hum. choice Clim. Change* 2 (2), 327–399.

Rotmans, J., Kemp, R., and Van Asselt, M. (2001). More Evolution Than Revolution: Transition Management in Public Policy. *foresight* 3 (1), 15–31. doi:10.1108/14636680110803003

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.